

PROFESSIONAL SERVICES AGREEMENT
Arrowhead Ranch Water Reclamation Facility Improvements
Study, Design and Construction Administration Services
Project No 121337
January 6, 2014

This Professional Services Agreement ("Agreement") is entered into and effective between CITY OF GLENDALE, an Arizona municipal corporation ("City") and Carollo Engineers, Inc., a Delaware corporation, authorized to do business in the State of Arizona, ("Consultant") as of the 28 day of January, 20 14 ("Effective Date").

RECITALS

- A. City intends to undertake a project for the benefit of the public and with public funds that is more fully set forth in **Exhibit A**, Project (the "Project");
- B. City desires to retain the professional services of Consultant to perform certain specific duties and produce the specific work as set forth in the attached **Exhibit B**, Project Scope of Work ("Scope");
- C. Consultant desires to provide City with professional services ("Services") consistent with best consulting or architectural practices and the standards set forth in this Agreement, in order to complete the Project; and
- D. City and Consultant desire to memorialize their agreement with this document.

AGREEMENT

The parties hereby agree as follows:

1. Key Personnel; Other Consultants and Subcontractors.

- 1.1 Professional Services. Consultant will provide all Services necessary to assure the Project is completed timely and efficiently consistent within Project requirements, including, but not limited to, working in close interaction and interfacing with City and its designated employees, and working closely with others, including other consultants or contractors, retained by City.
- 1.2 Project Team.
 - a. Project Manager.
 - (1) Consultant will designate an employee as Project Manager with sufficient training, knowledge, and experience to, in the City's opinion, complete the project and handle all aspects of the Project such that the work produced by Consultant is consistent with applicable standards as detailed in this Agreement; and
 - (2) The City must approve the designated Project Manager.
 - b. Project Team.
 - (1) The Project Manager and all other employees assigned to the Project by Consultant will comprise the "Project Team."
 - (2) Project Manager will have responsibility for and will supervise all other employees assigned to the Project by Consultant.
 - c. Discharge, Reassign, Replacement.
 - (1) Consultant acknowledges the Project Team is comprised of the same persons and roles for each as may have been identified in **Exhibit A**.

- (2) Consultant will not discharge, reassign, replace or diminish the responsibilities of any of the employees assigned to the Project who have been approved by City without City's prior written consent unless that person leaves the employment of Consultant, in which event the substitute must first be approved in writing by City.
- (3) Consultant will change any of the members of the Project Team at the City's request if an employee's performance does not equal or exceed the level of competence that the City may reasonably expect of a person performing those duties, or if the acts or omissions of that person are detrimental to the development of the Project.

d. Subcontractors.

- (1) Consultant may engage specific technical contractors (each a "Subcontractor") to furnish certain service functions.
- (2) Consultant will remain fully responsible for Subcontractor's services.
- (3) Subcontractors must be approved by the City.
- (4) Consultant will certify by letter that all contracts with Subcontractors have been executed incorporating requirements and standards as set forth in this Agreement.

2. **Schedule.** The Services will be undertaken in a manner that ensures the Project is completed timely and efficiently in accordance with the Project.

3. **Consultant's Work.**

3.1 Standard. Consultant must perform Services in accordance with the standards of due diligence, care, and quality prevailing among consultants having substantial experience with the successful furnishing of Services for projects that are equivalent in size, scope, quality, and other criteria under the Project and identified in this Agreement.

3.2 Licensing. Consultant warrants that:

- a. Consultant and its Subconsultants or Subcontractors will hold all appropriate and required licenses, registrations and other approvals necessary for the lawful furnishing of Services ("Approvals"); and
- b. Neither Consultant nor any Subconsultant or Subcontractor has been debarred or otherwise legally excluded from contracting with any federal, state, or local governmental entity ("Debarment").
 - (1) City is under no obligation to ascertain or confirm the existence or issuance of any Approvals or Debarments, or to examine Consultant's contracting ability.
 - (2) Consultant must notify City immediately if any Approvals or Debarment changes during the Agreement's duration. The failure of the Consultant to notify City as required will constitute a material default under the Agreement.

3.3 Compliance. Services will be furnished in compliance with applicable federal, state, county and local statutes, rules, regulations, ordinances, building codes, life safety codes, and other standards and criteria designated by City.

3.4 Coordination; Interaction.

- a. For projects that the City believes requires the coordination of various professional services, Consultant will work in close consultation with City to proactively interact with any other professionals retained by City on the Project ("Coordinating Project Professionals").

- b. Consultant will meet to review the Project, Schedule and in-progress work with Coordinating Project Professionals and City as often and for durations as City reasonably considers necessary in order to ensure the timely work delivery and Project completion.
- c. For projects not involving Coordinating Project Professionals, Consultant will proactively interact with any other contractors when directed by City to obtain or disseminate timely information for the proper execution of the Project.

3.5 Work Product.

- a. Ownership. Upon receipt of payment for Services furnished, Consultant grants to City, and will cause its Subconsultants or Subcontractors to grant to the City, the exclusive ownership of and all copyrights, if any, to evaluations, reports, drawings, specifications, project manuals, surveys, estimates, reviews, minutes, all "architectural work" as defined in the United States Copyright Act, 17 U.S.C § 101, *et seq.*, and other intellectual work product as may be applicable ("Work Product").
 - (1) This grant is effective whether the Work Product is on paper (e.g., a "hard copy"), in electronic format, or in some other form.
 - (2) Consultant warrants, and agrees to indemnify, hold harmless and defend City for, from and against any claim that any Work Product infringes on third-party proprietary interests.
- b. Delivery. Consultant will deliver to City copies of the preliminary and completed Work Product promptly as they are prepared.
- c. City Use.
 - (1) City may reuse the Work Product at its sole discretion.
 - (2) In the event the Work Product is used for another project without further consultations with Consultant, the City agrees to indemnify and hold Consultant harmless from any claim arising out of the Work Product.
 - (3) In such case, City will also remove any seal and title block from the Work Product.

4. Compensation for the Project.

- 4.1 Compensation. Consultant's compensation for the Project, including those furnished by its Subconsultants or Subcontractors will not exceed \$4,318,380 as specifically detailed in **Exhibit D** ("Compensation").
- 4.2 Change in Scope of Project. The Compensation may be equitably adjusted if the originally contemplated Scope as outlined in the Project is significantly modified.
 - a. Adjustments to Compensation require a written amendment to this Agreement and may require City Council approval.
 - b. Additional services which are outside the Scope of the Project contained in this Agreement may not be performed by the Consultant without prior written authorization from the City.
 - c. Notwithstanding the incorporation of the Exhibits to this Agreement by reference, should any conflict arise between the provisions of this Agreement and the provisions found in the Exhibits and accompanying attachments, the provisions of this Agreement shall take priority and govern the conduct of the parties.
- 4.3 Allowances. An "Allowance" may be identified in **Exhibit D** only for work that is required by the Scope and the value of which cannot reasonably be quantified at the time of this Agreement.
 - a. As stated in Sec. 4.1 above, the Compensation must incorporate all Allowance amounts identified in **Exhibit D** and any unused allowance at the completion of the Project will remain with City.

- b. Consultant may not add any mark-up for work identified as an Allowance and which is to be performed by a Subconsultant.
 - c. Consultant will not use any portion of an Allowance without prior written authorization from the City.
 - d. Examples of Allowance items include, but are not limited to, subsurface pothole investigations, survey, geotechnical investigations, public participation, radio path studies and material testing.
- 4.4 Expenses. City will reimburse Consultant for certain out-of-pocket expenses necessarily incurred by Consultant in connection with this Agreement, without mark-up (the "Reimbursable Expenses"), including, but not limited to, document reproduction, materials for book preparation, postage, courier and overnight delivery costs incurred with Federal Express or similar carriers, travel and car mileage, subject to the following:
- a. Mileage, airfare, lodging and other travel expenses will be reimbursable only to the extent these would, if incurred, be reimbursed to City of Glendale personnel under its policies and procedures for business travel expense reimbursement made available to Consultant for review prior to the Agreement's execution, and which policies and procedures will be furnished to Consultant;
 - b. The Reimbursable Expenses in this section are approved in advance by City in writing; and
 - c. The total of all Reimbursable Expenses paid to Consultant in connection with this Agreement will not exceed the "not to exceed" amount identified for Reimbursable Services in the Compensation.

5. **Billings and Payment.**

5.1 Applications.

- a. Consultant will submit monthly invoices (each, a "Payment Application") to City's Project Manager and City will remit payments based upon the Payment Application as stated below.
- b. The period covered by each Payment Application will be one calendar month ending on the last day of the month.

5.2 Payment.

- a. After a full and complete Payment Application is received, City will process and remit payment within 30 days.
- b. Payment may be subject to or conditioned upon City's receipt of:
 - (1) Completed work generated by Consultant and its Subconsultants and Subcontractors; and
 - (2) Unconditional waivers and releases on final payment from all Subconsultants and Subcontractors as City may reasonably request to assure the Project will be free of claims arising from required performances under this Agreement.

5.3 Review and Withholding. City's Project Manager will timely review and certify Payment Applications.

- a. If the Payment Application is rejected, the Project Manager will issue a written listing of the items not approved for payment.
- b. City may withhold an amount sufficient to pay expenses that City reasonably expects to incur in correcting the deficiency or deficiencies rejected for payment.

6. Termination.

6.1 For Convenience. City may terminate this Agreement for convenience, without cause, by delivering a written termination notice stating the effective termination date, which may not be less than 15 days following the date of delivery.

- a. Consultant will be equitably compensated for Services furnished prior to receipt of the termination notice and for reasonable costs incurred.
- b. Consultant will also be similarly compensated for any approved effort expended, and approved costs incurred, that are directly associated with Project closeout and delivery of the required items to the City.

6.2 For Cause. City may terminate this Agreement for cause if Consultant fails to cure any breach of this Agreement within seven days after receipt of written notice specifying the breach.

- a. Consultant will not be entitled to further payment until after City has determined its damages. If City's damages resulting from the breach, as determined by City, are less than the equitable amount due but not paid Consultant for Services furnished, City will pay the amount due to Consultant, less City's damages, in accordance with the provision of Sec. 5.
- b. If City's direct damages exceed amounts otherwise due to Consultant, Consultant must pay the difference to City immediately upon demand; however, Consultant will not be subject to consequential damages more than \$1,000,000 or the amount of this Agreement, whichever is greater.

7. **Conflict.** Consultant acknowledges this Agreement is subject to A.R.S. § 38-511, which allows for cancellation of this Agreement in the event any person who is significantly involved in initiating, negotiating, securing, drafting, or creating the Agreement on City's behalf is also an employee, agent, or consultant of any other party to this Agreement.

8. Insurance.

8.1 Requirements. Consultant must obtain and maintain the following insurance ("Required Insurance"):

- a. Consultant and Subconsultants and Subcontractors. Consultant, and each Subconsultant or Subcontractor performing work or providing materials related to this Agreement must procure and maintain the insurance coverages described below (collectively referred to herein as the "Consultant's Policies"), until each Party's obligations under this Agreement are completed.
- b. General Liability.
 - (1) Consultant must at all times relevant hereto carry a commercial general liability policy with a combined single limit of at least \$1,000,000 per occurrence and \$2,000,000 annual aggregate limit.
 - (2) Subconsultants and Subcontractors must at all times relevant hereto carry a general commercial liability policy with a combined single limit of at least \$4,000,000 per occurrence.
 - (3) This commercial general liability insurance must include independent contractors' liability, contractual liability, broad form property coverage, XCU hazards if requested by the City, and a separation of insurance provision.
 - (4) These limits may be met through a combination of primary and excess liability coverage.
- c. Professional Liability. Consultant must maintain a professional errors and omissions liability policy providing a minimum limit of \$1,000,000 for each claim and a \$2,000,000 annual aggregate limit.

- d. Auto. A business auto policy providing a liability limit of at least \$1,000,000 per accident for Consultant and \$1,000,000 per accident for Subconsultants and Subcontractors and covering owned, non-owned and hired automobiles.
- e. Workers' Compensation and Employer's Liability. Consultant must also maintain a workers' compensation and employer's liability policy providing at least the minimum benefits required by Arizona law.
- f. Notice of Changes. Consultant's Policies must provide for not less than 30 days' advance written notice to City Representative of:
 - (1) Cancellation or termination of Consultant's Policies;
 - (2) Reduction of the coverage limits of any of Consultant's Policies; and
 - (3) Any other material modification of Consultant's Policies related to this Agreement.
- g. Certificates of Insurance.
 - (1) Within 10 business days after the execution of the Agreement, Consultant must deliver to City Representative certificates of insurance for each of Consultant's Policies, which will confirm the existence or issuance of Consultant's Policies in accordance with the provisions of this section, and copies of the endorsements of Consultant's Policies in accordance with the provisions of this section.
 - (2) City is and will be under no obligation either to ascertain or confirm the existence or issuance of Consultant's Policies, or to examine Consultant's Policies, or to inform Consultant, Subconsultant, or Subcontractor in the event that any coverage does not comply with the requirements of this section.
 - (3) Consultant's failure to secure and maintain Consultant's Policies and to assure Consultant's Policies as required will constitute a material default under the Agreement.
- h. Other Contractors or Vendors.
 - (1) Other contractors or vendors that may be contracted with in connection with the Project must procure and maintain insurance coverage as is appropriate to their particular contract.
 - (2) This insurance coverage must comply with the requirements set forth above for Consultant's Policies (e.g., the requirements pertaining to endorsements to name the parties as additional insured parties and certificates of insurance).
- i. Policies. Except with respect to workers' compensation and Consultant's professional liability coverages, City must be named and properly endorsed as additional insureds on all liability policies required by this section.
 - (1) The coverage extended to additional insureds must be primary and must not contribute with any insurance or self insurance policies or programs maintained by the additional insureds.
 - (2) All insurance policies obtained pursuant to this section must be with companies legally authorized to do business in the State of Arizona and reasonably acceptable to all parties.

8.2 Subconsultants and Subcontractors.

- a. Consultant must also cause its Subconsultants and Subcontractors to obtain and maintain the Required Insurance.
- b. City may consider waiving these insurance requirements for a specific Subconsultant or Subcontractor if City is satisfied the amounts required are not commercially available to the

Subconsultant or Subcontractor and the insurance the Subconsultant or Subcontractor does have is appropriate for the Subconsultant or Subcontractor's work under this Agreement.

- c. Consultant and Subcontractors must provide to the City proof of the Required Insurance whenever requested.

8.3 Indemnification.

- a. To the fullest extent permitted by law, Consultant must defend, indemnify, and hold harmless City and its elected officials, officers, employees and agents (each, an "Indemnified Party," collectively, the "Indemnified Parties") for, from, and against any and all claims, demands, actions, damages, judgments, settlements, personal injury (including sickness, disease, death, and bodily harm), property damage (including loss of use), infringement, governmental action and all other losses and expenses, including attorneys' fees and litigation expenses (each, a "Demand or Expense" collectively "Demands or Expenses") asserted by a third-party (i.e. a person or entity other than City or Consultant) and that arises out of or results from the breach of this Agreement by the Consultant or the Consultant's negligent actions, errors or omissions (including any Subconsultant or Subcontractor or other person or firm employed by Consultant), whether sustained before or after completion of the Project.
- b. This indemnity and hold harmless provision applies even if a Demand or Expense is in part due to the Indemnified Party's negligence or breach of a responsibility under this Agreement, but in that event, Consultant will be liable only to the extent the Demand or Expense results from the negligence or breach of a responsibility of Consultant or of any person or entity for whom Consultant is responsible.
- c. Consultant is not required to indemnify any Indemnified Parties for, from, or against any Demand or Expense resulting from the Indemnified Party's sole negligence or other fault solely attributable to the Indemnified Party.

9. **Immigration Law Compliance.**

- 9.1 Consultant, and on behalf of any Subconsultant or Subcontractor, warrants, to the extent applicable under A.R.S. § 41-4401, compliance with all federal immigration laws and regulations that relate to their employees as well as compliance with A.R.S. § 23-214(A) which requires registration and participation with the E-Verify Program.
- 9.2 Any breach of warranty under this section is considered a material breach of this Agreement and is subject to penalties up to and including termination of this Agreement.
- 9.3 City retains the legal right to inspect the papers of any Consultant, Subconsultant, or Subcontractor employee who performs work under this Agreement to ensure that the Consultant, Subconsultant or any Subcontractor is compliant with the warranty under this section.
- 9.4 City may conduct random inspections, and upon request of City, Consultant will provide copies of papers and records of Consultant demonstrating continued compliance with the warranty under this section. Consultant agrees to keep papers and records available for inspection by the City during normal business hours and will cooperate with City in exercise of its statutory duties and not deny access to its business premises or applicable papers or records for the purposes of enforcement of this section.
- 9.5 Consultant agrees to incorporate into any subcontracts under this Agreement the same obligations imposed upon Consultant and expressly accrue those obligations directly to the benefit of the City. Consultant also agrees to require any Subconsultant or Subcontractor to incorporate into each of its own subcontracts under this Agreement the same obligations above and expressly accrue those obligations to the benefit of the City.

- 9.6 Consultant's warranty and obligations under this section to the City is continuing throughout the term of this Agreement or until such time as the City determines, in its sole discretion, that Arizona law has been modified in that compliance with this section is no longer a requirement.
- 9.7 The "E-Verify Program" above means the employment verification program administered by the United States Department of Homeland Security, the Social Security Administration, or any successor program.

10. Notices.

- 10.1 A notice, request or other communication that is required or permitted under this Agreement (each a "Notice") will be effective only if:
- a. The Notice is in writing; and
 - b. Delivered in person or by overnight courier service (delivery charges prepaid), certified or registered mail (return receipt requested).
 - c. Notice will be deemed to have been delivered to the person to whom it is addressed as of the date of receipt, if:
 - (1) Received on a business day before 5:00 p.m. at the address for Notices identified for the Party in this Agreement by U.S. Mail, hand delivery, or overnight courier service; or
 - (2) As of the next business day after receipt, if received after 5:00 p.m.
 - d. The burden of proof of the place and time of delivery is upon the Party giving the Notice.
 - e. Digitalized signatures and copies of signatures will have the same effect as original signatures.

10.2 Representatives.

- a. Consultant. Consultant's representative (the "Consultant's Representative") authorized to act on Consultant's behalf with respect to the Project, and his or her address for Notice delivery is:

Carollo Engineers, Inc
 Chad D. Meyer, P.E., Associate
 4600 E. Washington St., Ste. 500
 Phoenix, AZ 85034

- b. City. City's representative ("City's Representative") authorized to act on City's behalf, and his or her address for Notice delivery is:

City of Glendale
 c/o Bill Passmore, Principal Engineer
 5850 W. Glendale Ave.
 Glendale, Arizona 85301

With required copy to:

City Manager
 City of Glendale
 5850 West Glendale Avenue
 Glendale, Arizona 85301

City Attorney
 City of Glendale
 5850 West Glendale Avenue
 Glendale, Arizona 85301

- c. Concurrent Notices.
 - (1) All notices to City's representative must be given concurrently to City Manager and City Attorney.

- (2) A notice will not be deemed to have been received by City's representative until the time that it has also been received by the City Manager and the City Attorney.
- (3) City may appoint one or more designees for the purpose of receiving notice by delivery of a written notice to Consultant identifying the designee(s) and their respective addresses for notices.

d. Changes. Consultant or City may change its representative or information on Notice, by giving Notice of the change in accordance with this section at least ten days prior to the change.

11. **Financing Assignment.** City may assign this Agreement to any City-affiliated entity, including a non-profit corporation or other entity whose primary purpose is to own or manage the Project.

12. **Entire Agreement; Survival; Counterparts; Signatures.**

12.1 Integration. This Agreement contains, except as stated below, the entire agreement between City and Consultant and supersedes all prior conversations and negotiations between the parties regarding the Project or this Agreement.

- a. Neither Party has made any representations, warranties or agreements as to any matters concerning the Agreement's subject matter.
- b. Representations, statements, conditions, or warranties not contained in this Agreement will not be binding on the parties.
- c. Inconsistencies between the solicitation, any addenda attached to the solicitation, the response or any excerpts attached as **Exhibit A**, and this Agreement, will be resolved by the terms and conditions stated in this Agreement.

12.2 Interpretation.

- a. The parties fairly negotiated the Agreement's provisions to the extent they believed necessary and with the legal representation they deemed appropriate.
- b. The parties are of equal bargaining position and this Agreement must be construed equally between the parties without consideration of which of the parties may have drafted this Agreement.
- c. The Agreement will be interpreted in accordance with the laws of the State of Arizona.

12.3 Survival. Except as specifically provided otherwise in this Agreement, each warranty, representation, indemnification and hold harmless provision, insurance requirement, and every other right, remedy and responsibility of a Party, will survive completion of the Project, or the earlier termination of this Agreement.

12.4 Amendment. No amendment to this Agreement will be binding unless in writing and executed by the parties. Electronic signature blocks do not constitute execution for purposes of this Agreement. Any amendment may be subject to City Council approval.

12.5 Remedies. All rights and remedies provided in this Agreement are cumulative and the exercise of any one or more right or remedy will not affect any other rights or remedies under this Agreement or applicable law.

12.6 Severability. If any provision of this Agreement is voided or found unenforceable, that determination will not affect the validity of the other provisions, and the voided or unenforceable provision will be reformed to conform with applicable law.

12.7 Counterparts. This Agreement may be executed in counterparts, and all counterparts will together comprise one instrument.

13. **Term.** The term of this Agreement commences upon the Effective Date and continues for a one year initial period. The City may, at its option and with the approval of the Consultant, extend the term of this

Agreement an additional one year, renewable on an annual basis. Consultant will be notified in writing by the City of its intent to extend the Agreement period at least 30 calendar days prior to the expiration of the original or any renewal Agreement period. Price adjustments will only be reviewed during the Agreement renewal period. There are no automatic renewals of this Agreement.

14. **Dispute Resolution.** Each claim, controversy and dispute (each a "Dispute") between Consultant and City will be resolved in accordance with **Exhibit E**. The final determination will be made by the City.
15. **Exhibits.** The following exhibits, with reference to the term in which they are first referenced, are incorporated by this reference.

Exhibit A	Project
Exhibit B	Scope of Work
Exhibit C	Schedule
Exhibit D	Compensation
Exhibit E	Dispute Resolution

(Signatures appear on the following page.)

The parties enter into this Agreement effective as of the date shown above.

City of Glendale,
an Arizona municipal corporation



By: Brenda Fischer
Its: City Manager

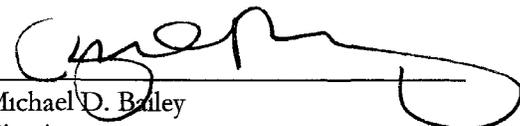
ATTEST:



Pamela Hanna (SEAL)

City Clerk

APPROVED AS TO FORM:



Michael D. Bailey
City Attorney

Carollo Engineers, Inc.,
a Delaware Corporation authorized to do
business in Arizona



By: Robert A. Ardizzone
Its: Vice President



By: Chad D. Meyer
Its: Associate Vice President

EXHIBIT A
Professional Services Agreement

PROJECT

(Cover Page)

EXHIBIT A

PROJECT DESCRIPTION

The following Scope of Services describes the engineering services to be provided by the Carollo Engineers/Black & Veatch team (ENGINEER) associated with the City of Glendale, Arizona (CITY) Arrowhead Ranch Water Reclamation Facility – Facility Improvements Study, Design, and Construction Administration Services project.

The ARWRF is located north of Union Hills Drive and west of Loop 101 and treats wastewater from a tributary area located in the northern part of the City. The current treatment plant permitted capacity is 4.5 million gallons per day (mgd) average annual daily flow (AADF). The plant provides tertiary treatment to incoming municipal wastewater. The treatment plant's current AADF is approximately 3.0 mgd. The plant effluent is delivered using either the outer loop effluent pipe to effluent lakes in Arrowhead Ranch residential development or into the aquifer through adjacent recharge wells within the premises of the ARWRF and three other recharge wells at "Oasis." The ARWRF utilizes a three-train conventional activated sludge, biological nutrient removal (BNR) aeration system including anoxic zones, followed by six rectangular clarifiers to provide for secondary treatment. The secondary clarifiers are equipped with HDPE chain and flight sludge collectors. Four of the clarifier's sludge collection systems use two shared motor drives, each drive serving a pair of two adjacent clarifiers. The ARWRF utilizes DynaSand™ continuous backwash, upflow filters for tertiary filtration, and a Trojan 3000+ UV system for disinfection. The ARWRF is permitted for and classified as an Arizona Department of Environmental Quality (ADEQ) A+ Reclaimed Water Facility.

The purpose of the following Scope of Services structure is to provide the CITY with the benefit of a comprehensive assessment and subsequent improvement recommendation "list" for the items being evaluated. For each of the evaluation items, preliminary costs will be defined, and the CITY will have the most current and relevant information available to them to assist with the future decision-making associated with the ARWRF. The overall Scope of Services includes the following services as designated by the Series 100 – 700 Work Breakdown Structure:

- Series 100 – Project Administration and Management
Overall project management, develop meeting agenda, facilitate project meetings, cost control and project monitoring, schedule development, cash flow, develop subconsultant agreements and perform subconsultant management, and overall project administration.
- Series 200 – Facility Evaluation and Design Concept Development
Perform data collection, review the existing ARWRF studies, overall facility evaluation, treatment process and capacity evaluation, Headworks, Tertiary Filtration, Secondary Clarifier, Odor Control, and Support Facility evaluations, Recommended Plant Improvement Alternative development, and Design Concept Report (20% Design)
- Series 300 – Detailed Design
Develop a Design Document Development Plan, Basis of Design (30% Design) Report, 60%/90%/Final Design Submittal Packages, Agency Review and Permitting Assistance, and Design Coordination with the CMAR.
- Series 400 – Construction Administration
Perform Construction Administration and Inspection Services, Substantial and Final Completion Inspection, and preparation of Construction Drawings of Record.
- Series 500 – Start-Up and Warranty Period Services
Perform project Start-Up and two-year "on-call" (as needed) Warranty Services.
- Series 600 – SCADA and PLC Configuration Services

Perform a Plant-wide Electrical System Vulnerability Analysis, Control System Equipment Standardization and Migration, perform SCADA Upgrades and Database Maintenance, and develop a summary SCADA and PLC Configuration Services technical memorandum.

- Series 700 – Miscellaneous Services
Develop Allowance tasks for subconsultant services, Scope of Service items that are not able to be fully defined at this time, reimbursable and other direct costs, and miscellaneous services utilizing an Owners Contingency (\$250,000) for additional items that are requested and items/issues that were unknown or unforeseen at the time of developing this Scope of Services.

The list of project needs generally consists of the following items:

- Regulatory Requirements: Develop a Technical Memorandum (TM) in Series 200 that summarizes existing regulatory requirements and identifies potential future regulatory requirements that may impact the plant.
- Plant Process Evaluation: Review the previously developed ARWRF process and hydraulic models and the existing report on plant capacity. Update the models and utilize them to perform the overall plant evaluation and support planning and design of the Headworks, Filters, Secondary Clarifiers, and Odor Control systems.
- Headworks: Evaluate and subsequently design the operation and physical condition of the Headworks, including the influent channels, isolation gates, comminutor mounting bracket, Parshall flume, ventilation, odor control, screening, grit removal, and ancillary items to determine if the recommended improvement strategy for the Headworks is replacement in its entirety, or rehabilitation. Evaluate the demolition of the existing Oxidation Ditch for future land use, if a new headworks facility is to be constructed.
- Tertiary Filtration: Study, evaluate, and design the replacement of the DynaSand™ filters (CITY may leave DynaSand™ filters in place at their discretion). Master Plan the replacement footprint using the existing Traveling Bridge Filter to allow filter configuration, future process rehabilitation, future process upgrades, and an operational procedure that will allow the removal of a treatment train from service for maintenance.
- Secondary Clarifiers: Evaluate and subsequently design the electrical, and control, systems of the clarifiers and develop preliminary and final design for full replacement of the systems, including new conductors, new controls, internal equipment, and the Motor Control Center (MCC).
- Plant-Wide Odor Control Systems: Evaluate and subsequently design the condition and operation of the existing odor control systems and make a recommendation for replacement or rehabilitation. Utilize the findings from the Plant Process Evaluation to assist the operations staff in developing strategies to lower the operations and maintenance (O&M) costs associated with the Odor Control systems.
- Splitter Box No. 1: Rehabilitate the concrete and possibly add mechanical mixers to replace the air mixing.
- Secondary Clarifiers No. 1 to No. 4: Split the dual drives into single drives.
- Splitter Box No. 2: Rehabilitate the concrete if necessary, modify SB No. 2 to reduce the flow to Clarifier No. 1, and possibly add flow metering to each Clarifier influent pipe to control and regulate flow to the Secondary Clarifiers.
- Evaluate separating some of the major treatment processes onto both the “back-up” 2000 Amp and “primary” 3000 Amp ARWRF main services to decrease plant vulnerability and increase operational flexibility and redundancy.
- Provide SCADA (Supervisory Control and Data Acquisition) and PLCs (Programmable Logic Controllers) programming associated with the newly designed and constructed systems (Headworks, Tertiary Filtration, Secondary Clarifiers, and Odor Control).
- Secure a Significant Amendment to the ARWRF Aquifer Protection Permit (APP).
- Evaluate replacing the waste activated sludge (WAS) pumps and include preliminary and final design efforts for pump replacement, mechanical, and electrical support facilities.
- Evaluate a maximum of three bypass strategies for the end-of-the-line ARWRF plant.

- Evaluate replacing the existing “back-up” 2000 Amp service at the ARWRF with a 3000 Amp service to match the “primary” 3000 Amp service.
- Evaluate the requirements for upgrading outdated networking equipment including VFDs, valve actuators, PLCs, and other equipment as required. Evaluate upgrading outdated SCADA screens and trending packages to the CITY’s latest iFix software package including clean up of the existing database.
- Evaluate the plant-wide electrical system and define vulnerabilities that should be corrected.
- Install a redundant Non-Potable Water (NPW) pump in the plant and install a Variable Frequency Drive (VFD) to match the existing NPW pump.

EXHIBIT B
Professional Services Agreement

SCOPE OF WORK

(Cover Page)

EXHIBIT B

SCOPE OF SERVICES

The Scope of Services was formatted in the following Work Breakdown Structure to identify individual work activities that will be monitored using computerized project management techniques. The overall project was divided into several Series, with each Series delineated by several service elements (Tasks). Service elements may be further subdivided into subtasks.

SERIES 100 PROJECT ADMINISTRATION AND MANAGEMENT SERVICES

- Task 101 – Project Management Plan
- Task 102 – Project Schedule
- Task 103 – Project Progress Meetings (Evaluation and Design)
- Task 104 – Project Control and Reporting
- Task 105 – Cash Flow
- Task 106 – Subconsultant Agreements and Management

ENGINEER will perform the following project management and monitoring activities through all phases of the project (Series 200 - 600), as delineated in the following tasks.

Task 101 – Project Management Plan

Description: This Task develops a detailed Project Management Plan (PMP), which is a Project Notebook in a three-ring binder, with the following tabs:

- Project Description / Introduction
- Project Team – Client, Engineer, Subconsultants, and CMAR Contact Information
- Scope of Services
- Labor Hour Budgets
- Schedule
- Monthly Progress Reports
- Project Work Order Numbers
- Communications Protocol
- Quality Management
- Project Risk Management
- Project Resources
- Meeting Notes
- Decision Log

The ENGINEER will submit a draft PMP for CITY review and approval. Once the PMP is approved, the ENGINEER will submit six (6) copies of the PMP for the CITY's use. The ENGINEER will also distribute copies of the PMP to key team members as a project management tool. The ENGINEER will be also required to maintain a copy of the PMP updated for the CITY, which will be handed over to the CITY at the end of the Project.

Task 102 – Project Schedule

Description: ENGINEER will develop and maintain a progress schedule during the Evaluation and Detailed Design phases of the project. The schedule will be developed in MS Project format. Each activity of the approved Scope of Services will be incorporated into the schedule. Project timelines, along with identification of project milestones, will be provided in Gantt format. The Schedule will include both the original baseline and actual progress. The

project Schedule will be updated and distributed quarterly at the Project Update Meetings through to the completion of the Series 300 design activities. The Construction Manager at Risk (CMAR) will be responsible for the Construction Baseline Schedule.

The ENGINEER will prepare a significant event calendar within fourteen (14) days of the written Notice to Proceed (NTP). The initial schedule will show the original start date with initial completion date as a reference. One copy of the original overall schedule with original timeline and data dates will be submitted at the project Kick-Off meeting. Additionally, minimum general time frames for project milestones will be provided. The ENGINEER will update the schedule monthly during Series 200 and 300 to keep it current showing comparison with the baseline/target schedule. The updated schedule report will be submitted with the monthly invoice. If requested by the CITY, the ENGINEER will also provide a detailed "Construction Phasing" plan.

Task 103 – Project Progress Meetings (Evaluation and Design)

Description: ENGINEER will hold and facilitate monthly project meetings (by conference call) if necessary, to maintain the project budget and schedule during the Evaluation and Detailed Design phases of the project. Agendas will be submitted to the CITY at least two (2) days before the meeting. Draft meeting minutes will be submitted to the CITY for review no more than seven (7) days following each meeting. Agendas and final meeting minutes will be transmitted to meeting attendees by email in PDF format.

Project Progress Meetings under the Series 200 – 300 efforts will include:

103.1 Progress Meetings: ENGINEER will conduct twenty-one (21) monthly meetings (by conference call) with CITY representatives throughout the Evaluation and Design phases to keep the CITY informed of the project progress, and obtain input and direction as required for outstanding project issues. A firm day and time will be established at the project Kick-Off Meeting for all progress meetings. The location of meetings (for Glendale staff) will be the ARWRF conference room unless the specific topic to be addressed warrants a change of venue. Before each meeting, ENGINEER will prepare all relevant information to be discussed including, a project schedule update as noted in Task 102 and a list of action items and their status for discussion. ENGINEER will capture CITY-approved decisions through meeting minutes, to be distributed to the meeting participants by email in PDF format for review and approval. Following receipt of comments by the CITY, ENGINEER will prepare final minutes for distribution in the same manner.

NOTE: Construction Progress Meetings corresponding to Series 400 activities have been delineated in Task 401.1 – Representation on Behalf of the City.

103.2 Partnering Meetings: ENGINEER will conduct two (2) partnering meetings with the CITY and CMAR, at the inception of the Task 302 (Basis of Design 30% design) services and at the start of construction.

Task 104 – Project Control and Reporting

Description: ENGINEER will provide monthly progress reports and invoices throughout the duration of the project as follows:

104.1 Monthly Progress Reports: ENGINEER will develop and submit to the CITY monthly progress reports that identify the following:

- Work completed since the previous report.
- Project status, including scheduled and actual percent completion for the major tasks.
- Dates of anticipated milestones and/or deliverables in the upcoming month.

104.2 **Monthly Invoices:** The ENGINEER will submit a projection of monthly project billings with the fee proposal. The projected billings will be consistent with the project tasks, the project schedule, and the fee proposal. **Invoices will be delivered to the City's Project Manager no later than the 25th day of the month.** The invoices will be consistent with the project tasks, project schedule, fee proposal, and projected billings. The invoice will identify the contract number and include the amount of each work task and consultant service identified in the approved fee proposal. The percent complete shall be determined by the project schedule, tasks, and fee proposal per tasks. The total invoice submitted shall be less than or equal to the task percent complete with the associated cost. The ENGINEER will submit one hard copy invoice to Bill Passmore, P.E., Project Manager, City of Glendale Engineering Department, 5850 West Glendale Avenue - Suite 315, Glendale, Arizona 85301.

Invoices will be submitted with a copy of the monthly progress report, and will include:

- Total contract amount
- Total percent complete (% complete by Task from Progress Report)
- Total earned to date
- Less previous billings
- Total earned this period
- Amount remaining
- Total amount due

Task 105 – Cash Flow

Description: The ENGINEER will develop a quarterly cash flow schedule that will provide information regarding future funds needed to complete the project. The ENGINEER will collect or estimate the cash flow information from all the parties involved with the project (e.g., design subconsultants and CMAR, etc.) and will combine this information using the “Cash Flow” workbook provided by the CITY and send it electronically to Gloria Olaya (golaya@glendaleaz.com) with the Engineering Department.

Task 106 – Subconsultant Agreements and Management

Description: The ENGINEER will prepare and coordinate the necessary subconsultant agreements required for the project, and will coordinate and manage the subconsultants throughout the course of the project accordingly.

Deliverables: The deliverables for Series 100 – Project Administration and Management Services include:

- Project Management Plan
- Project Schedule/Updates
- Monthly Project Reports (42)
- Monthly Invoices (42)
- Monthly Progress Meeting – Agendas and Minutes (21)
- Quarterly Cash Flow Schedule (14)

SERIES 200 FACILITY EVALUATION AND DESIGN CONCEPT DEVELOPMENT SERVICES

- Task 201 – Data Collection
- Task 202 – Review Existing ARWRF Studies
- Task 203 – Infrastructure and Existing Treatment Facilities Evaluation
- Task 204 – Treatment Process Evaluation and Assessment
- Task 205 – Plant Capacity Evaluation and Assessment

- Task 206 – Headworks, Filtration, Secondary Clarifiers, and Odor Control Evaluation and Assessment
- Task 207 – Plant-Wide Electrical System Vulnerability Analysis
- Task 208 – Support Facilities
- Task 209 – Recommended Plant Improvement Alternatives
- Task 210 – Design Concept Report (20% design)

At the completion of Series 200, the Technical Memoranda (TMs) that were developed for each task will be collectively submitted as part of the DCR. To the fullest extent possible, the CITY will provide all available data, reports, and information that could supplement the efforts of the DCR.

Task 201 – Data Collection

CITY will provide to the ENGINEER, as available, all relevant information that will aid in the progress of the project. This includes, but is not limited to, technological reports, geotechnical reports, topographical surveys, property legal descriptions, ARWRF As-Built (Record) drawings, historical influent flow, loading, and odor control data and current flow, loading, and odor control data.

Wastewater Flow and Characteristics

- 201.1 Evaluate Flow Projections. ENGINEER will coordinate with CITY to review the historical plant flow, loading data, and planned growth estimates to determine if the current flow projections for the ARWRF are accurate.
- 201.2 Establish Design Peaking Factor. ENGINEER will validate the peaking factors established for the ARWRF.
- 201.3 Review Water Quality Analytical Data. ENGINEER will collect and review available influent water quality analytical data provided by the CITY, associated with the ARWRF, to establish anticipated influent water quality. Constituents of interest include:
- 5-Day Biochemical Oxygen Demand (BOD) (filtered and unfiltered)
 - Chemical Oxygen Demand (COD) (filtered and unfiltered)
 - Total Suspended Solids (TSS)
 - Total Dissolved Solids (TDS)
 - Total Kjeldahl Nitrogen (TKN)
 - Ammonia-Nitrogen (NH₃-N)
 - Nitrate-Nitrogen (NO₃-N)
 - Alkalinity (as CaCO₃)
 - Oil and Grease
- 201.4 Wastewater Sampling Plan. If sufficient information is not available to allow the ENGINEER to determine the anticipated influent quality (with required certainty), the ENGINEER will develop a Wastewater Sampling Plan (and corresponding costs associated with the Sampling Plan) to support Task 201.4. Laboratory fees (if the tests cannot be run at the City of Glendale laboratory) will be paid by the ENGINEER and submitted for payment under Series 700 - Miscellaneous (Owner's) Contingency.
- 201.5 Establish Design Water Quality Concentrations And Loadings. Based on the data collected in previous tasks for the ARWRF Facility Improvements, ENGINEER will establish the design water quality concentrations and loadings.

201.6 Collect Historical Plant Odor Data: ENGINEER will collect the historical plant odor data to establish past and current issues with the headworks, filtration, and odor control systems and summarize the solutions that were implemented by ARWRF staff. Treatment data will be reviewed and evaluated for trends to give an overall look at the past performance of the headworks, filtration, and odor control systems.

201.7 **Deliverables:** The deliverables for Task 201 – Data Collection will be a TM that summarizes the information collected in Task 201.

Task 202 – Review Existing ARWRF Studies

202.1 Review Existing ARWRF Studies

Description: The ENGINEER will review existing documentation available from the CITY relative to previous engineering studies, models, projections, and design documents relative to the ARWRF. This may include, but not be limited to:

- Engineering Studies
- ARWRF Plant Pilot-tests
- Hydraulic or Process Models
- Conceptual and Detail Design Documents
- As-Built (Record) Drawings

After review of the existing ARWRF literature, the ENGINEER will request any additional documents required to thoroughly evaluate the conditions of the plant/processes before beginning development of the DCR.

Task 203 – Infrastructure and Existing Treatment Facilities Evaluation

203.1 Site Assessment Document Review: The ENGINEER will review existing documentation available from the CITY relative to the assessment of the site for new building construction and area planning. This may include, but not be limited to:

- Drainage Report
- Archeological Investigation
- Phase I Environmental Site Assessment

If after reviewing the existing site assessment documents, the ENGINEER determines additional testing (potholing, excavation etc) is required to assess the conditions of the site, they will summarize the additional testing and submit a plan to the CITY for review and approval. No level of effort or costs associated with performing the additional site assessment or testing is included in the Scope of Services or Fee Proposal.

203.2 Existing Treatment Facilities Evaluation:

The ENGINEER will visually review the physical condition of the ARWRF treatment facilities including; the Headworks, Filters, Secondary Clarifiers, the Odor Control System (see Task 206), and the Electrical Systems (see Task 207), and document their condition. Any design information for the referenced facilities will be made available from the CITY relative to the structure evaluation. This may include, but not be limited to:

- Detailed Design Drawings
- As-Built (Record) Drawings

Design Calculations

- Materials Testing Records (if available)
- Maintenance Logs or Records

After the initial review of the facilities condition, the ENGINEER will recommend any additional work or testing efforts (non-destructive concrete testing, x-rays and core sampling etc.) required to further assess the existing facilities before completion of the design. No level of effort or costs associated with the additional condition assessment work is included in the Scope of Services or Fee Proposal.

203.3 **Deliverables:** The deliverables for Task 203 – Infrastructure and Existing Treatment Facilities Evaluation will be a TM that summarizes the information collected in Task 203 and recommendations on plant structures and facilities requiring structural rehabilitation and estimated construction costs for those improvements.

Task 204 – Treatment Process Evaluation and Assessment

204.1 Computational Fluid Dynamics (CFD) Modeling of Secondary Clarifiers: ENGINEER will perform CFD modeling on the clarifiers where the sludge collectors are experiencing solids carryover. The results of the modeling will identify a solution that will reduce the solids load to the filters.

204.2 Biological Process Modeling: ENGINEER will update the existing plant process model. Using the updated process model, the ENGINEER will evaluate the biological processes to determine if there are any treatment efficiencies (lower chemical, O&M, or electrical costs) to be gained by adjusting operational parameters. The ENGINEER will perform a process audit to lower chemical, O&M, and electrical expenditures.

Liquid Stream Design Criteria Validation

204.3 Review Design Criteria of ARWRF Treatment Processes: ENGINEER will review previous efforts including any previous Technology Assessment Reports, Basis of Design Reports for ARWRF, and other existing CITY documents regarding the main ARWRF treatment processes (headworks, influent pump station, aeration basin, secondary clarifiers, filters, and disinfection systems).

ENGINEER will perform an assessment of the design criteria for each main unit process with respect to the ability to meet anticipated permits, flow, loading, and/or site requirements to produce Class A+ quality effluent, as well as a preliminary assessment of the capital and O&M costs for each alternative considered. Evaluation will be limited to the main treatment systems as noted above.

204.4 Design Criteria Development: ENGINEER will work with the CITY to develop final design criteria for the treatment process alternatives evaluated in Task 204.3.

204.5 Process Peer Review: ENGINEER will perform an internal QA/QC peer review of the Task 204.3 treatment process evaluation.

204.6 **Deliverables:** The deliverables for Task 204 – Treatment Process Evaluation and Assessment will be a TM that summarizes the information collected and identifies a list of upgrades necessary along with priority and anticipated timeline. These upgrades will serve as part of the basis of this project Scope and be utilized to develop the Task 209 – Recommended Plant Improvement Alternatives (and subsequently Task 210 – Design Concept Report) deliverables for the ARWRF. The information developed in Task 204 will also include suggestions on plant process operational changes, recommended treatment process improvements to reduce vulnerability, and increase redundancy, and provide additional operational flexibility.

Task 205 – Plant Capacity Evaluation and Assessment

- 205.1 Update Plant Hydraulic Model to Estimate Rated/Actual Treatment Capacity: ENGINEER will update the existing ARWRF plant process/hydraulic model to estimate the actual rated treatment capacity of the ARWRF and identify “pinch points” in the process train.
- 205.2 Identify Potential Future Regulatory Requirements and Effect on Treatment Capacity: ENGINEER will identify potential regulatory requirements that may be promulgated or be considered for implementation and determine their potential impact on the ARWRF.
- 205.3 **Deliverables:** The deliverables for Task 205 – Plant Capacity Evaluation and Assessment will be a TM that summarizes the information collected in Task 205.

Task 206 – Headworks, Filtration, Secondary Clarifiers, and Odor Control Evaluation and Assessment

This Scope of Services includes Structural, Geotechnical, Architectural, Mechanical, Electrical, Instrumentation and Control, and Programming services (including power needs assessment), and support discipline services required for the “recommended improvements” design effort as developed in Task 209. Evaluation of structural conditions will be limited to the existing headworks, Splitter Boxes, and Traveling Bridge Filter facilities. Concrete will be reviewed using the basis of a cost analysis/benefit ratio of repair versus full replacement.

The ENGINEER has included design services for full replacement of the existing headworks facilities in this Scope of Services to establish a Series 300 budget. The evaluation and recommendation for rehabilitation or replacement for the existing headworks facilities will be made as part of the Series 200 – Facility Evaluation and Design Concept Development Services.

The preliminary concept for the new Tertiary Filtration system will be to have a cloth media system housed within the existing infrastructure (Traveling Bridge Filter) at the ARWRF. The Series 300 budget is based initially on this assumption.

The ENGINEER has included design services for Secondary Clarifier improvements to include; clarifiers No. 1 to No. 4 - split the dual drives into single drives, evaluate the electrical, and control, systems of the clarifiers and develop preliminary and final design for full replacement for the electrical, and control systems, including new conductors, new controls, internal equipment, and the MCC.

The ENGINEER has included design services for full replacement of the existing Odor Control facilities in this Scope of Services. The Series 300 budget is based on this initial assumption. The evaluation and recommendation for rehabilitation or replacement for the existing Odor Control facilities will be made as part of the Series 200 – Facility Evaluation and Design Concept Development Services.

- 206.1 Evaluate and Assess ARWRF Headworks: The headworks will be evaluated and assessed for structural deterioration, operational reliability, past performance, estimated future performance, quality, functionality, economy, O&M costs, replacement cost, and other parameters. The results will be presented in a Headworks and Tertiary Filter Evaluation and Assessment Criteria Workshop (approximately a four (4) hour meeting). The principal section of the Evaluation and Assessment of the Headworks is:
- Headworks System Replacement Study to determine the cost-to-benefit of replacement versus rehabilitation or retrofitting of the existing system.
- 206.2 Evaluate and Assess the Tertiary Filtration Systems: The tertiary filtration systems will be evaluated and assessed for structural deterioration, operational reliability, past performance, estimated future performance, quality, functionality, economy, O&M costs, replacement cost, and other parameters. The

results will be presented in a Headworks and Tertiary Filtration Evaluation and Assessment Criteria Workshop. The principal section of the Evaluation and Assessment of the Tertiary Filtration systems is:

- Tertiary Filer Replacement Study to determine the cost-to-benefit of replacement versus rehabilitation or retrofitting of the existing system.

206.3 Evaluate and Assess the Secondary Clarifier System: The secondary clarifier system will be evaluated and assessed for structural deterioration, operational reliability, past performance, estimated future performance, quality, functionality, economy, O&M costs, replacement cost, and other parameters. The results will be presented in a Secondary Clarifier and Odor Control System Evaluation and Assessment Criteria Workshop (approximately a four (4) hour meeting). The principal sections of the Evaluation and Assessment of the Secondary Clarifier systems are:

- Clarifiers No. 1 to No. 4 - split the dual drives into single drives, evaluate the electrical, and control, systems of the clarifiers and develop preliminary and final design for full replacement for the electrical, and control systems, including new conductors, new controls, internal equipment, and the MCC.

206.4 Evaluate and Assess the Odor Control Systems: The odor control system will be evaluated and assessed for structural deterioration, operational reliability, past performance, estimated future performance, quality, functionality, economy, O&M costs, replacement cost, and other parameters. The results will be presented in an Secondary Clarifier and Odor Control Evaluation and Assessment Criteria Workshop. The principal section of the Odor Control Evaluation and Assessment of the Odor Control system is:

- Evaluation of the Existing Odor Control System to determine the cost-to-benefit of rehabilitation or retrofitting of the existing system.

206.5 Identify Headworks System Improvement Alternatives: ENGINEER will use the summarized findings from the evaluation and assessment of the headworks and make recommendations as to replacement or rehabilitated (retrofit) systems and technology selection for the detailed design. A maximum of three alternatives will be developed for replacement and process configuration, and weighted decision matrices will be developed for the CITY to review. Selection criteria will be weighted and Improvement Alternatives agreed to at the workshops noted in Task 206.9.

206.6 Identify Tertiary Filtration Improvement Alternatives: ENGINEER will use the summarized findings from the evaluation and assessment of the tertiary filtration system and make recommendations as to replacement or rehabilitated (retrofit) systems and technology selection for the detailed design. A maximum of three alternatives (including non-cloth media filtration) will be developed for replacement and process configuration, and weighted decision matrices will be developed for the CITY to review. Selection criteria will be weighted and Improvement Alternatives agreed to at the workshops noted in Task 206.9.

206.7 Identify Secondary Clarifier Improvement Alternatives: ENGINEER will use the summarized findings from the evaluation and assessment of the secondary clarifiers and make recommendations as to replacement or rehabilitated (retrofit) systems for the detailed design. A maximum of three alternatives will be developed for replacement and process configuration, and weighted decision matrices will be developed for the CITY to review. Selection criteria will be weighted and Improvement Alternatives agreed to at the workshops noted in Task 206.10.

206.8 Identify Odor Control System Improvement Alternatives: ENGINEER will use the summarized findings from the evaluation and assessment of the odor control system and make recommendations as to replacement or rehabilitated (retrofit) systems and technology selection for the detailed design. A maximum of three alternatives will be developed for replacement and process configuration, and weighted

decision matrices will be developed for the CITY to review. Selection criteria will be weighted and Improvement Alternatives agreed to at the workshops noted in Task 206.10.

- 206.9 Headworks and Tertiary Filtration Improvements Alternatives Workshop: ENGINEER will schedule and hold a workshop (4 hours) to develop a weighted decision matrix and selection of the recommended improvement alternative for the ARWRF Headworks system and the ARWRF Tertiary Filtration System. The recommended headworks improvement alternative will be included in the weighted decision matrix will be used for evaluating the two (2) Improvement Alternatives developed in Task 209.2 and scoring them to determine the final Recommended ARWRF Facility Improvement Alternative concept for further development in the DCR (Task 210). The recommended filtration improvement alternative will be included in the weighted decision matrix will be used for evaluating the two (2) Improvement Alternatives developed in Task 209.2 and scoring them to determine the final Recommended ARWRF Facility Improvement Alternative concept for further development in the DCR (Task 210).
- 206.10 Secondary Clarifier and Odor Control System Improvements Alternative Workshop: ENGINEER will schedule and hold a workshop (4 hours) to develop a weighted decision matrix and selection of the recommended improvement alternative for the ARWRF Secondary Clarifier system and the plant-wide Odor Control Systems. The recommended secondary clarifier improvement alternative will be included in the weighted decision matrix will be used for evaluating the two (2) Improvement Alternatives developed in Task 209.2 and scoring them to determine the final Recommended ARWRF Facility Improvement Alternative concept for further development in the DCR (Task 210). The recommended odor control improvement alternative will be included in the weighted decision matrix will be used for evaluating the two (2) Improvement Alternatives developed in Task 209.2 and scoring them to determine the final Recommended ARWRF Facility Improvement Alternative concept for further development in the DCR (Task 210).

Deliverables: The deliverables for Task 206 – Headworks, Filtration, Secondary Clarifiers, and Odor Control Evaluation and Assessment will be TMs that are developed for each of the four principal project components to summarize the information collected in Task 206 and will form part of the basis of the Recommended Plant Improvement Alternatives selected in Task 209.

Task 207 – Plant-Wide Electrical System Vulnerability Analysis

- 207.1 Collect Historical Plant Electrical Data: The ARWRF MCC, Switchgear, and portions of the plant-wide electrical system have reached the end of their useful design life. Under Task 207, the ENGINEER will collect the historical plant electrical usage, maintenance, repair, and cost data to establish past and current issues with the MCC, Switchgear, and plant-wide electrical systems. The evaluation will be based on current code requirements, age of equipment, proper functionality, and maintenance experience. The usage, maintenance, repair, and cost data will be reviewed and compared against new technologies (systems) currently available as upgrades to the existing system.
- 207.2 Evaluate and Assess MCC, Switchgear, and Electrical Systems: The MCC, Switchgear, and plant-wide electrical systems will be evaluated and assessed for obsolescence, deterioration, operational reliability, past performance, estimated future performance, quality, functionality, economy, O&M costs, replacement cost, and other parameters. The results will be presented as part of an Evaluation and Assessment Criteria Workshop. The principal sections of the Evaluation and Assessment of the MCC, Switchgear, and plant-wide electrical system are:
- (1) MCC Replacement - replacement of the MCC at the secondary clarifiers.

- (2) Evaluate the electrical, and control, systems of the clarifiers and develop preliminary and final design for full replacement for the electrical, and control systems, including new conductors, new controls, and internal equipment.
- (3) Evaluate replacing the existing “back-up” 2000 Amp service at the ARWRF with a 3000 Amp service to match the “primary” 3000 Amp service and separate some of the major treatment processes onto both services to decrease plant vulnerability and increase operational flexibility and redundancy.

207.3 Identify MCC, Switchgear, and Electrical System Improvement Alternatives: ENGINEER will use the summarized findings from the evaluation and assessment of the MCC, Switchgear, and plant-wide electrical systems and make recommendations as to replacement or rehabilitated (retrofit) systems for the detailed design. Several alternatives will be developed for replacement and weighted decision matrices will be developed for the CITY to review. Selection Criteria will be weighted and Improvement Alternatives agreed to at a Selection Workshop in Task 209.

Deliverables: The deliverables for Task 207 – Plant-Wide Electrical System Vulnerability Analysis will be a TM that is developed to summarize the information collected in Task 207 and will form part of the basis of the DCR in Task 213. No Series 300, 400, or 500 level of effort or compensation have been included for items undergoing evaluation in Task 207.

Task 208 – Support Facilities

208.1 Review Required Supporting Facilities: ENGINEER in conjunction with the CITY, will identify, and evaluate proposed supporting facilities for the ARWRF. Support buildings will be designed based on the 4.5 mgd build-out condition. Supporting facilities will include the following:

- Electrical power requirements for the ARWRF Facility Improvements
- Maintenance requirements.
- Utility systems; air, potable, and non-potable water and gas.
- Chemical systems.
- Instrumentation and control philosophy and architecture.
- Fire protection.
- SCADA, PLC and Other Control Requirements

208.2 Utility Coordination: ENGINEER will coordinate with applicable utilities and agencies for availability and requirements pertaining to natural gas (if available and required), power, telephone, etc. for the ARWRF Facility Improvement Project.

208.3 Design Criteria Development: ENGINEER will develop applicable preliminary design criteria for proposed supporting facilities.

208.4 **Deliverables:** The deliverables for Task 208 – Support Facilities, will be a TM summarizing the Support Facilities design information for all of the Task 208 efforts. Comments solicited from the CITY will be incorporated into the Final DCR in Task 210.

Task 209 – Recommended Plant Improvement Alternatives

209.1 Determine Conceptual Design and Technical Criteria (Workshop): ENGINEER will schedule and hold a workshop to refine the preliminary design concept and technical criteria for plant operational procedures to define the plant improvement concept. The criteria will be used for comparison of the Improvement Alternative solutions developed in Task 209.2.

- 209.2 Summarize Identified ARWRF Facility Improvement Alternatives: ENGINEER will summarize the findings from Tasks 201 through 208 and identify two (2) potential overall ARWRF Facility Improvement Alternative solutions that will meet the needs of the CITY as determined from the Conceptual Design and Technical Criteria developed in Task 209.1.
- 209.3 Construction Cost Estimate for ARWRF Facility Improvement Alternatives: ENGINEER will develop order of magnitude construction cost estimates for the two (2) potential ARWRF Facility Improvement Alternative solutions that were identified in Task 209.2. These cost estimates will be used in the weighted decision matrix in Task 209.4.
- 209.4 Develop Weighted Decision Matrix (Workshop): ENGINEER will schedule and hold a workshop (same Workshop as referenced in Task 209.1) to develop a weighted decision matrix for the prioritization of the recommended improvements, preliminary design concept, initial technical criteria, and recommended alternative construction costs that were determined in Tasks 209.1 through and 209.3. The weighted decision matrix will be used for evaluating the two (2) Improvement Alternatives developed in Task 209.2 and scoring them to determine the final Recommended ARWRF Facility Improvement Alternative concept for further development in the DCR (Task 210). The weighted decision matrix will also rank/prioritize the remaining improvements that are outside the four principal project components.
- 209.5 **Deliverables**: The deliverables for Task 209 – Recommended Plant Improvement Alternatives will be all that is developed to summarize the information collected in Tasks 201 - 208 and will form the basis of the DCR in Task 210.

Task 210 – Design Concept Report (20% Design)

The ENGINEER will proceed with the Design Concept Report (DCR), Basis of Design Report (BDR), and Detailed Design efforts under the assumption that the project budget will support the replacement or rehabilitation recommendations made in the DCR. The ENGINEER has prepared this Scope of Services based on the understanding that the list of recommended improvements (basis of the items to be developed under Series 300 – Detailed Design) for the project will be agreed to, and finalized, at the Design Concept Report (DCR – 20% Design) stage.

The ENGINEER will conduct a review workshop (approximately two weeks after the submittal of the DCR) to define and solidify an ARWRF Facility Improvements design concept and criteria (Subtask 209.1) for use in the development of the final DCR. It is anticipated that the workshop for the DCR will require four (4) hours. The ENGINEER will prepare an agenda for the DCR review workshop.

The workshop will build on work previously performed at the ARWRF and the findings of Tasks 201 - 208. The results of the workshop will be summarized in meeting minutes. The following workshop topics are anticipated:

- Regulatory Issues, CITY Objectives, Design Concept and Criteria
- Headworks Improvements Concept
- Filtration Improvements Concept
- Secondary Clarifier and Electrical Equipment Concept
- Odor Control Improvements Concept
- Support Facilities Improvement Concept
- Electrical System, SCADA, and “Additional Evaluation” Facility Improvements

The ENGINEER will prepare an opinion of probable construction cost for the Design Concept Report (20% design) based on the ENGINEER's opinion, experience, and judgment only. ENGINEER will evaluate the CMAR cost model at each detailed design milestone. This evaluation will be thorough enough to determine whether the cost

model accurately reflects the cost of construction. The ENGINEER cannot, and does not guarantee that future proposals, final GMP, or actual project construction costs will not vary from the pre-final cost estimates prepared by the CMAR. The ENGINEER has no control over cost of labor, materials, equipment, or services furnished by others, or over the CMAR's construction means or methods, competitive bidding or market conditions, practices, or bidding strategies.

At the completion of Task 209, the TMs prepared in Tasks 201 – 209 will be collectively submitted as the DCR. To the fullest extent possible, the CITY will provide all available data, reports, and information that could supplement the efforts of the DCR.

210.1 **Deliverables:** The deliverables for Task 210 will be a DCR submitted as “Draft” for review, then “Final” once all CITY review comments/suggestions are received at the “DCR Review Workshop” and implemented. The ENGINEER will summarize the TMs developed in Tasks 201 through 208 into a Design Concept Report. The DCR will contain an Executive Summary of the findings of each TM. The DCR will identify the Recommended ARWRF Facility Improvement Alternative (the complete list of items to be improved for the project construction budget) to the CITY based on the weighted decision matrix developed in Task 209.4. The Recommended ARWRF Facility Improvement Alternative concept will be the basis of the 20% Design drawings developed in the DCR. A revised order of magnitude construction cost estimate will be prepared for the Recommended ARWRF Facility Improvement Alternative concept including possible construction phasing scenarios to meet anticipated CITY Capital Improvement Plan budgets.

SERIES 300 DETAILED DESIGN

- Task 301 – Basis of Design (30% Design)
- Task 302 – Basis of Design Report (30% Design)
- Task 303 – Detailed Design (60% Submittal)
- Task 304 – Detailed Design (90% Submittal)
- Task 305 – Detailed Design (Final Submittal)
- Task 306 – Agency Review/Permitting Assistance
- Task 307 – Design Submittal Review Workshops
- Task 308 – Design Coordination With CMAR

The detailed design services will include a multi-discipline design approach, as described by the following. Detailed drawings, specifications, and typical details will be developed for each discipline as follows:

Drawings: Design drawings will be two-dimensional (2-D) in AutoCAD or Micro-Station (per CITY preference) format, with content as defined herein. Full-size drawings will be 22-inch by 34-inch, and electronic copies of drawings will be provided on CD, with interim submittals in PDF format and final submittal in AutoCAD/Micro-Station format.

Technical Specifications: Technical specifications will be developed to set the special conditions and technical requirements for construction of the Project. Specifications will be based on the 16-Division format of the Construction Specifications Institute (CSI), and developed in ENGINEER's standard formats. Specifications will be in MS Word format, printed double-sided on 8-1/2-inch by 11-inch paper, and bound into book volumes. Electronic copies of specifications in both MS Word and PDF file formats will also be provided on CD.

For the basis of this Scope, it was assumed that the front-end specification (Division 0 and 1) requirements will be based on the City of Glendale Supplemental General Conditions, which will be supplemented by the Engineers Joint Contract Documents Committee (EJCDC) General Conditions.

Typical Details: ENGINEER will develop and compile “typical” or “standard” details to supplement the design drawings. Typical details will be in ENGINEER’s standard format and/or the CITY’s standard format, compiled and presented on 8-1/2-inch by 11-inch paper and bound into book volumes up through the 90% design submittal, upon which they will be transferred onto design drawings for inclusion into the 90% and Final sets of Contract Drawings. Typical detail callouts on design drawings will be identified by applicable typical detail number.

Task 301 – **Basis of Design (30% Design)**

NOTE: The Scope of Services for the Detailed Design Phase (300 Series) tasks presented herein is based on a Construction Manager at Risk (CMAR) method of project delivery.

The ENGINEER will conduct a series of tasks in preparation for the development of the Basis of Design and the Basis of Design Report (BDR) for the ARWRF. A one-day (1 day) Design CAMP® (see Task 301.6) will precede these tasks and build on work previously performed during the design concept for the ARWRF site. The results of the Design CAMP® will be summarized in meeting minutes and included in the BDR. To the fullest extent possible, the CITY will provide all available data, reports, information, etc., that could supplement the efforts of the preliminary design.

CITY will provide a single point of contact for returning review comments to the ENGINEER. CITY will provide comments on proposed design concepts in a timely fashion to facilitate overall project schedule, including but not limited to processes, design criteria, numbering systems, electrical and controls system architecture, materials, equipment, allowable manufacturers, and/or design features.

- 301.1 Develop Tag Number Scheme: ENGINEER will work with the CITY Wastewater O&M Group to develop and submit a preliminary “tag numbering” scheme for equipment, valves, and field instrumentation, for review and approval by the CITY. Tag numbering scheme will include equipment, valve, or instrument letter abbreviations and numerical identifiers. Discussions with the CITY regarding any necessary coordination with other established CITY facility tag numbering or comprehensive system-wide monitoring requirements will also be included. The ENGINEER will also include the information from the update to the SCADA Standards Document.
- 301.2 Codes and Standards Review: ENGINEER will conduct one (1) pre-review meeting with representatives from the various CITY Departments including Engineering, Building, Planning, and Fire Departments to discuss codes and standards requirements. ENGINEER will prepare an agenda and any necessary supporting materials before meeting, and will prepare and distribute minutes following meeting.
- 301.3 Summarize Applicable Codes and Standards. ENGINEER will review and summarize the most current key codes and standards as they apply to the detailed design efforts. The CITY will provide direction on the appropriate edition of codes for use on the Project. The most current version of the following codes and standards will likely be included in this effort (with applicable CITY amendments):
- International Building Code
 - International Mechanical Code
 - Uniform Plumbing Code
 - National Electric Code
 - Uniform Fire Code, Article 80 - Hazardous Materials
 - National Fire Protection Association (NFPA) 820 - Fire Protection in WWTPs
 - Instrument Society of America (ISA)
 - Illuminating Engineering Society (IES) of North America
 - Life Safety Code (NFPA 101)

- Americans with Disabilities Act (ADA)
- International Fire Code

301.4 Site Documentation and Identification (Topographic Survey): ENGINEER will perform a site topographical survey of the ARWRF site to the level and limits required to provide area planning. Existing aerial mapping will be used to establish site contours if necessary. Field survey will be used to identify and/or confirm horizontal locations and vertical elevations of existing facilities on the site. Vertical control will be based on CITY dictated datum. The topographical survey will not include the location and establishment of perimeter property lines based on existing legal descriptions and available survey reviews. No permanent horizontal and vertical control benchmarks will be established on-site. Temporary benchmarks using the CITY control will be set for identification of aboveground structures, buildings, facilities, channels, manholes, power poles, access roads, and other identified utility pole, box, or structure. Staked geotechnical borings will be supplied if required for design. ENGINEER will not perform a native plant inventory of the site before construction.

301.5 Develop Area Plan Site Layout: ENGINEER will review and develop a proposed area plan site layout of treatment process, based on the DCR developed in Task 210 through the project timeline. Site layout for liquid and solid stream components will identify the following:

- Existing facilities at the site
- Setback requirements at build-out on all sides of property.
- General flow stream layout and unit process locations. Details of arrangement of equipment to be located within various buildings and facilities are addressed under subsequent Detailed Design (300 Series) phases.

Any Master Planning of the site is limited to within the plant boundaries and involves area planning of the plant footprint. Identifying future improvements and developing a capital program is beyond the scope of this project. All landscape design activities are limited to the areas of disturbance caused by the ARWRF Facility Improvements project. The site footprint planning will be based on a 4.5 mgd ultimate build-out facility.

301.6 Basis of Design CAMP®: ENGINEER, CITY, and concerned parties will participate in a one-day Design CAMP®. The Design CAMP® will build on work previously performed during the DCR to develop the basis of design for the ARWRF site. The results of the Design CAMP® will be summarized and documented in meeting minutes and included as the foundation of the BDR. To the fullest extent possible, the CITY will provide all available data, reports, information, etc., that could supplement the efforts of the preliminary design.

Task 302 – Basis of Design Report (30% Design)

Basis of Design Report (30% Design): The BDR (30% Design) submittal will be in accordance with the proposed Schedule presented in **Exhibit C**, and will consist of the following:

302.1 30% Design Drawings: ENGINEER will produce 30% design drawings and submit to the CITY as part of the BDR for review and comment at the BDR (30% Design) review workshop (see Task 307.1). The BDR review workshop will also act as the Value Engineering workshop at this design milestone.

302.2 30% Design Specifications: ENGINEER will develop a list (table of contents) of technical specifications expected for the Project. The list of specifications will be arranged in tabular format by CSI Division and be included as part of the BDR.

- 302.3 30% Design Typical Details: ENGINEER will develop a list of typical details expected for the project and include the list as part of the BDR. The list of “typical details” will be arranged in tabular format by discipline.
- 302.4 30% BDR Quality Assurance/Quality Control: the ENGINEER’s quality management team will peer review the 30% Design BDR for consistency with the project design and design intent. ENGINEER’s quality management team will provide internal comments to the ENGINEER’s design team and PM for incorporation into the 30% Design BDR submittal.
- 302.5 30% CMAR Cost Model Review: ENGINEER will review the CMAR’s 30% Cost Model for consistency with the project design and design intent. ENGINEER will provide comments to the CITY for review with the CMAR.
- 302.6 Basis of Design Report (30% Design): The BDR will be submitted as “Draft” for review, then “Final” once all CITY review comments/suggestions are implemented. The ENGINEER will summarize the work developed in Tasks 303 into a BDR. The BDR will contain an Executive Summary of the findings. The BDR will identify the design criteria and parameters associated with the Recommended ARWRF Facility Improvement Alternative to the CITY as developed in Task 209. A revised order of magnitude construction cost estimate will be prepared for the BDR

Task 303 – Detailed Design (60% Submittal)

ENGINEER will perform a detailed design in accordance with the design concepts set forth in the DCR (Task 210) and BDR (Task 302.6).

60% Design Submittal: The 60% design submittal will be scheduled in accordance with the proposed deliverable schedule presented in **Exhibit C**, and will consist of the following. ENGINEER will also provide a copy of the 30% design (BDR) comment log to the CITY with the 60% review submittal. Control descriptions will also be substantially complete and provided to the CITY as part of the 60% design specification submittal

- 303.1 60% Design Drawings: ENGINEER will produce six (6) half-size sets of the 60% design drawings and submit to the CITY for review and comment at the 60% design review workshop (Task 308.2). The 60% design drawing submittal will incorporate applicable comments provided by the CITY at the BDR (30% Design) review workshop.
- 303.2 60 % Specifications: ENGINEER will produce six (6) sets of the 60% design specifications and submit to the CITY for review and comment at the 60% design review workshop.
- 303.3 60% Typical Details: ENGINEER will compile and develop the “typical details” expected for the project. The “typical details” will be presented in book format (8-1/2-inch x 11-inch) for ease of review. The ENGINEER will produce six (6) sets of the 60% design typical details and submit to the CITY for review and comment at the 60% design review workshop.
- 303.4 60% Design Quality Assurance/Quality Control: the ENGINEER’s quality management team will peer review the 60% Design package for consistency with the project design and design intent. ENGINEER’s quality management team will provide internal comments to the ENGINEER’s design team and PM for incorporation into the 60% Design submittal package.
- 303.5 60% CMAR Cost Model Review. ENGINEER will review the CMAR’s 60% Cost Model for consistency with the project design and design intent. ENGINEER will provide comments to the CITY for review with the CMAR.

Task 304 – Detailed Design (90% Submittal)

90% Design Submittal: The 90% design submittal will be in accordance with the proposed Schedule in **Exhibit C**, and will consist of the following items. ENGINEER will also provide a copy of the 60% design submittal comment log to the CITY with the 90% design submittal.

304.1 90% Design Drawings. The ENGINEER will produce fifteen (15) sets of the 90% design drawings. Five (5) sets of the drawings will be submitted to the CITY for review and comment at the 90% design review workshop. The 90% design drawings are to include applicable updates from the 60% design submittal drawing set, including the incorporation of applicable comments provided by the CITY at the 60% submittal review workshop (Task 307.2), as well as the inclusion of the “typical details” onto drawings.

Six (6) sets of the full-size plans and specifications will be for submission to the City of Glendale Community Development Department (COGCD) for code compliance review. Agency review sets will be sealed and stamped with “FOR AGENCY REVIEW ONLY - NOT FOR CONSTRUCTION” or similar note.

All applicable departmental review fees will be paid for by the ENGINEER through Series 700 – Miscellaneous Services. For the basis of this Scope of Services, it is assumed that two (2) COGCD submittals will be required. The initial submittal of six (6) sets to COGCD will be followed by a re-submittal of six (6) sets with incorporation of response to comments for final approval.

Four (4) sets of the full-size plans and specifications will be for submission to the Maricopa County Environmental Services Department (MCESD) for code compliance review. Agency review sets will be sealed and stamped with “FOR AGENCY REVIEW ONLY - NOT FOR CONSTRUCTION” or similar note. All applicable agency review fees will be paid for by the ENGINEER through Series 700 - Miscellaneous Services.

304.2 90% Specifications. ENGINEER will produce fifteen (15) sets of the 90% design specifications. Five (5) sets will be submitted to the CITY for review and comment at the 90% design review workshop. The 90% design submittal will incorporate CITY comments from the 60% submittal review workshop.

Six (6) sets of the specifications will be for submission to the COGCD and four (4) sets will be sent to the MCESD for code compliance review. Agency review sets will be sealed and stamped with “FOR AGENCY REVIEW ONLY - NOT FOR CONSTRUCTION” or similar note.

304.3 90% Design Quality Assurance/Quality Control: the ENGINEER’s quality management team will peer review the 90% Design package for consistency with the project design and design intent. ENGINEER’s quality management team will provide internal comments to the ENGINEER’s design team and PM for incorporation into the 90% Design submittal package.

304.4 90% CMAR Cost Model Review. ENGINEER will review the CMAR’s 90% Cost Model for consistency with the project design and design intent. ENGINEER will provide comments to the CITY for review with the CMAR.

Task 305 – Detailed Design (Final Submittal)

Final Design Submittal: The Final design submittal will be in accordance with the proposed Schedule presented in **Exhibit C**, and will consist of the following:

305.1 Final Design Drawings. ENGINEER will finalize, seal, and submit fifteen (15) copies of all design drawings in the appropriate format within thirty (30) days following receipt of all review comments provided by the CITY, COGCD, Maricopa County, and other review agencies. The Final design drawing

submittal will incorporate agency review comments, as well as applicable comments provided by the CITY at the 90% submittal review workshop (Task 308.3). Electronic copies of final drawings in AutoCAD (or Microstation) format will also be provided on CD. The ENGINEER shall anticipate one round of comments from COGCDD before the drawings and specifications are approved. ENGINEER will be responsible for approval of the final drawings by the permitting agencies.

- 305.2 Final Specifications. ENGINEER will finalize, seal, and submit fifteen (15) copies of all technical specifications in the appropriate format within thirty (30) days following receipt of all review comments provided by the CITY, COGCDD, Maricopa County, and other review agencies. The Final design specification submittal will incorporate the agency review comments, as well as applicable comments provided by the CITY at the 90% submittal review workshop. Electronic copies of technical specifications in MS Word format will also be provided on CD.
- 305.3 Final Design Quality Assurance/Quality Control: the ENGINEER's quality management team will peer review the Final Design package for consistency with the project design and design intent. ENGINEER's quality management team will provide internal comments to the ENGINEER's design team and PM for incorporation into the Final (100%) Design submittal package.
- 305.4 Final CMAR GMP Review. ENGINEER will review the CMAR's Final GMP for consistency with the project design and design intent. ENGINEER will provide comments to the CITY for review with the CMAR.

Task 306 – Agency Review / Permitting Assistance

The ENGINEER will not review the effluent management strategies (including emergency discharge requirements) to determine potential permitting requirements in this Scope of Services. The ENGINEER has not included level of effort or compensation for any permitting activities outside of the ADEQ APP amendment, Maricopa County Environmental Services Department (MCESD) ATC/AOC and Air Quality Permit, or the City of Glendale Building Department permit.

- 306.1 Administrative Requirements: ENGINEER will hold a pre-meeting with the following agencies to summarize anticipated administrative permitting requirements (or amendments) for the site and accompanying facilities, and will acquire copies of all relevant permit applications. Contacts will include the following:
- ADEQ
 - MCESD
- 306.2 Glendale Community Development Department and City of Glendale Engineering Department Meeting: ENGINEER will conduct one (1) pre-application meeting with representatives of the COGCDD and Engineering Department. ENGINEER will develop and submit a pre-application site plan submittal as required before attendance at the pre-application meeting. ENGINEER will prepare an agenda and any necessary supporting materials before meeting, and will prepare and distribute minutes following meeting.
- 306.3 Permit Application Assistance: ENGINEER will coordinate with the applicable administrative agencies for the preparation and submittal of permit applications (or permit amendments). Permit applications or permit amendments will be submitted to the CITY for review and approval. The ENGINEER will prepare and submit all completed applications to agencies on the CITY's behalf. The ENGINEER will be responsible for the initial "permit application submittal fees" and will be compensated under Series 700 - Miscellaneous Services. The CITY will pay for the remaining permit review fees directly. The ENGINEER will review agency comments from each of the initial permit submittals, as applicable, and will prepare

response(s) on behalf of the CITY. Potential permits for application may include some (or all) of the following:

- Significant Amendment to the ARWRF Aquifer Protection Permit (APP)
- City of Glendale Building Permit
- MCESD Air Quality Permit
- MCESD Approval to Construct and Approval of Construction

306.4 MCESD Approval to Construct / Approval of Construction: ENGINEER will work with the CITY to complete and submit an MCESD Approval to Construct permit (and subsequent Approval of Construction efforts) application. All initial permit application fees will be the responsibility of the ENGINEER who will be compensated for those fees under Series 700 - Miscellaneous Services. Permit review fees will be the responsibility of the CITY and paid for directly.

306.5 Regulatory Plans: ENGINEER will develop a Hazardous Materials Management Plan (HMMP) as a draft single-volume report entitled "Hazardous Materials Management Plan" (HMMP) for the ARWRF process improvement components designed as part of this Contract. The HMMP will be submitted to the CITY for review and approval. Upon receipt of comments, ENGINEER will submit a final plan to the CITY for distribution.

Task 307 – Design Submittal Review Workshops

ENGINEER will conduct the following submittal review workshops in accordance with the proposed Schedule presented in **Exhibit C**. The CITY will participate in the workshops and provide review comments at that time. Review workshop minutes will be recorded by ENGINEER and distributed to the CITY by email in a PDF format within one (1) week following each workshop. Following each review workshop, ENGINEER will compile CITY comments into a "Comments/Change Log" for sign-off by the CITY and ENGINEER. The Submittal Review Workshops will include both Constructability and Operability reviews.

307.1 Basis of Design Report (30% Design) Review Workshop: ENGINEER will conduct a half-day (4 hour) submittal review workshop following the BDR submittal to the CITY. ENGINEER will develop a log of the CITY'S review comments and submit with 60% design review submittal.

307.2 60% Submittal Review Workshop: ENGINEER will conduct a one-day (1 day, or two half-days) submittal review workshop following the 60% design submittal to the CITY. ENGINEER will develop a log of the CITY'S review comments and submit with 90% design review submittal.

307.3 90% Submittal Review Workshop: ENGINEER will conduct a one-day (1 day, or two half-days) submittal review workshop following the 90% design submittal to the CITY. ENGINEER will develop a log of CITY'S' review comments and submit with Final "back check" submittal.

Task 308 – Design Coordination with CMAR

The CITY will be adding a CMAR to the design partnership (CITY, ENGINEER, and CMAR) at the 30% Design milestone (BDR development). The ENGINEER will be responsible for design coordination with the CMAR team. The ENGINEER'S level of effort to coordinate with the CMAR shall generally consist of:

- Solicit CMAR Input During Design Development
- Provide Information For Cost Estimating
- Provide Input For the Construction Phasing Plan and Schedule
- Provide Assistance With Long-Lead Procurement Activities
- Evaluate Alternative Systems Suggested by the CMAR

- Respond to Constructability Review Comments by the CMAR
- Prepare any Design Change Addenda as Required
- Assist and Review During Cost Model and GMP Development
- Perform Cost Model and GMP Proposal Review and Prepare Recommendation to the CITY
- Assist CITY With Review of the Subcontractor/Supplier Bid and Selection Process

The CITY has stated they intend to issue two contracts with the CMAR; one during pre-construction services and one GMP for the CMAR to proceed with construction. The ENGINEER will perform the Task 308 efforts during both of the CMAR contracts. If the project is split into multiple GMPs, the ENGINEER will have the right to negotiate a Change Order for the Task 308 services.

SERIES 400 CONSTRUCTION ADMINISTRATION

- 401 – Construction Administration Services
- 402 – Construction Inspection Services
- 403 – Substantial and Final Completion Inspection
- 404 – Construction Drawings of Record

The following section of the Scope of Services describes the engineering services associated with the Construction Administration and Inspection effort for the ARWRF Facility Improvements project. The Scope of Services is based on the CITY'S selection of the Construction Management at Risk (CMAR) project delivery methodology. This Scope of Services is based on the project being designed and constructed in a single phase and only one cost model being prepared at each design milestone. The CMAR will take over all cost estimating responsibilities from the preparation of their 30% design cost model. ENGINEER will prepare an independent cost estimate at the DCR (20% Design) and Basis of Design Report (BDR - 30% Design) milestones.

Task 401 – Construction Administration Services

The Construction Administration Phase services as defined herein are based on the following assumptions:

1. The anticipated construction period will be a total of twenty-one (21) months for the ARWRF Facility Improvements project, from CMAR Notice to Proceed.
2. The ENGINEER will furnish a full-time, on-site Resident Project Representative (RPR) during the construction activities on the four principal treatment plant components (Headworks, Filters, Secondary Clarifiers, and Odor Control systems).
3. Commissioning consultation or other related services on portions of the ARWRF outside of the facilities updated under the Facility Improvements Project are excluded.

401.1 **Representation on Behalf of the City.** The ENGINEER will consult with and advise CITY and act as its representative during construction. The extent and limitations of the duties, responsibilities and authority of ENGINEER as assigned herein shall not be modified, except as ENGINEER may otherwise agree in writing. All CITY instructions to Contractor(s) will be issued through ENGINEER who will have authority to act on behalf of CITY to the extent provided in this scope of services except as otherwise provided in writing.

ENGINEER will not be responsible for the means, methods, techniques, sequences or procedures of construction selected by Contractor(s) (unless otherwise specified in the construction contract documents) or the safety precautions and programs associated with the work of Contractor(s).

ENGINEER will make site(s) visits appropriate for the size of Project and type of construction at periods appropriate to the various stages of construction to inspect, as an experienced and qualified professional,

the progress and quality of the executed work of Contractor(s) and to determine if such work is proceeding in accordance with the Contract Documents.

ENGINEER's efforts shall be directed toward providing a greater degree of confidence for CITY that the completed work of Contractor(s) will conform to the Contract Documents, but ENGINEER will not be responsible for the failure of Contractor(s) to perform the work in accordance with the Contract Documents.

On the basis of on-site examination of materials, equipment, and workmanship, ENGINEER will keep CITY informed of the progress of the work, will endeavor to guard CITY against defects and deficiencies in such work and will disapprove or reject work failing to conform to the Contract Documents. This task shall include the following items:

- (1) **Conduct Preconstruction Conference:** the ENGINEER will conduct a preconstruction conference. At the conference, the ENGINEER will identify field services to be provided by the ENGINEER and discuss appropriate coordination procedures. The ENGINEER will prepare an agenda for the meeting and will prepare and distribute the meeting minutes. The ENGINEER's Resident Project Representative (RPR) will conduct the meeting.
- (2) **Provide Construction Administration, Quality Assurance, And Coordination:** the ENGINEER will provide construction administration and quality control services during the course of construction to assure that the overall technical correctness of the construction phase services and that specified procedures are being followed and that schedules are being met. The ENGINEER will provide coordination functions during the construction phase as follows:
 - (a) Hold coordination meetings with the CITY representative and other City staff as appropriate
 - (b) Coordinate with regulatory and approving agencies and utilities as required
 - (c) Coordinate the work of specialty subconsultants assigned to the Project
 - (d) Verify Contractor's Material Safety Data Sheets (MSDS) are on file at the job site
- (3) **Provide Project Documents:** The ENGINEER will maintain and provide the following detailed project records and documentation during the construction phase: The Project records shall include correspondence, schedules, submittals, test data, project data, payments, change orders, meeting minutes, clarifications, mark-ups of drawings and specifications, control system documentation, status reports and other such documentation. Project records shall be delivered to the CITY's representative upon completion of the construction contract.

401.2 **Responses to RFIs:** ENGINEER will render interpretation and responses necessary for the proper execution and progress of the Work at the ARWRF site on written request of either the CITY or the CMAR, and submit written responses to the CITY's representative accordingly. Responses will be provided within five (5) working days upon receipt by the ENGINEER, or as agreed to by the CITY. ENGINEER will render all interpretations or decisions in good faith and in accordance with the requirements and intent of the Contract Documents. ENGINEER will not transmit any interpretations or clarifications directly to the CMAR. For the basis of this Scope of Services, the total number of anticipated RFI's per Task 401.2 is one-hundred and twenty (120). If these quantity values are significantly exceeded (greater than 20 percent), the ENGINEER reserves the right to negotiate a contract Change Order with the CITY.

401.3 **Design Clarifications.** ENGINEER will render Design Clarifications necessary for the proper execution or progress of the Work at the ARWRF site on written request of either the CITY or CMAR, and submit written responses to the CITY's representative accordingly. Responses will be provided within fifteen (15) working days upon receipt by the ENGINEER, or as agreed to by the CITY. ENGINEER will render all interpretations or decisions in good faith and in accordance with the requirements and intent of the Contract Documents. ENGINEER will not transmit any clarifications directly to the CMAR. For the basis of this

Scope of Services the total number of anticipated Engineer's Clarifications per Task 401.3 is thirty (30) if these quantity values are significantly exceeded (greater than 20 percent), the ENGINEER reserves the right to negotiate a contract Change Order with the CITY.

401.4 Change Order Reviews: ENGINEER will review major change order requests from the CMAR and provide opinion on the appropriateness of the change order request, in accordance with the Contract Documents. ENGINEER will provide written summary of opinion of change order request and submit to CITY'S representative accordingly. The total number of anticipated major change orders for review and action per Task 401.4 is anticipated to be ten (10) if these quantity values are significantly exceeded (greater than 20 percent), the ENGINEER reserves the right to negotiate a contract Change Order with the CITY. Minor changes in the day-to-day work will be the responsibility of the project's Resident Project Representative, and will be coordinated with the ENGINEER and CITY during construction progress meetings.

401.5 Technical Submittal Reviews: ENGINEER will review and process the ARWRF Facility Improvements related equipment and material submittals (i.e. samples, schedules, shop drawings, test results, product data, and other data) that the CMAR is required to submit for conformance with the Contract Documents.

MOPO Plan Submittals: ENGINEER will review CMAR's various Maintenance of Plant Operations (MOPO) plan submittals and provide written comments to CITY relative to any identified design-related impacts or conflicts. ENGINEER will also participate in the development of MOPOs, including attendance at MOPO meetings.

CMAR Start-up and Testing Plan Submittals: ENGINEER will review CMAR's Start-Up and Testing Plan submittals for compliance with the Contract Documents, and provide written comments to CITY relative to any identified design-related impacts or conflicts. A meeting will be held (in lieu of one Monthly Progress Meeting) to review and discuss the Start-Up and Testing Plan submittals.

Vendor O&M Manual Submittals: During the course of the Work, ENGINEER will verify that the various certificates, Operations and Maintenance (O&M) manual updates, and other data required for assembly and furnished by CMAR are applicable to the items actually installed. ENGINEER will set up an index system, utilizing standard size, and type binders with a manual numbering system that corresponds to the established index system. ENGINEER will check each manual submitted for completeness, for conformance to the design concept of the project, and for conformance with the Contract Documents.

The CMAR's submittals will be stamped appropriately to indicate results of the ENGINEER's review. Such review will determine the suitability of the CMAR's proposed details for implementing the design, technical submittals conform to the design information given in the Contract Documents, and is consistent with the design intent represented in the specifications and drawings. Such review and approval will not extend to means, methods, sequences, techniques, or procedures of construction selected by CMAR, or to associated safety precautions and programs, unless specifically required in the Contract Documents by the ENGINEER. The ENGINEER will also receive, review, and provide written comments to the CITY'S (for general content as required by specifications) maintenance and operating schedules and instructions, guarantees, and certificates of inspection that are to be assembled by CMAR in accordance with the Contract Documents.

The Contract Documents will be structured to indicate that the review of any re-submittals in excess of one resubmission will be at the expense of the CMAR. The total number of anticipated submittal reviews for review and action per Task 401.5 is anticipated to be three-hundred (300). If the quantity of re-submittals becomes excessive (greater than 20%), the ENGINEER reserves the right to potentially negotiate a contract Change Order with the CITY.

The submittal review process will be managed to provide timely review and response to the CMAR's submittals. ENGINEER will complete the review of submittals within fifteen (15) working days from ENGINEER's receipt of submittal, unless otherwise mutually agreed to by the CITYS and ENGINEER.

For the purposes of this task, the ENGINEER assumes that the CMAR will be responsible for maintaining independent submittal file copies. The ENGINEER also assumes that the CMAR submittals will be indexed and filed in accordance with the specification section number and specific equipment identified. ENGINEER will maintain files of submittals with a set being handed over to the CITY upon completion of the project.

401.6 ARWRF Facility Improvements O&M Manual Update: ENGINEER will prepare a supplement to the existing ARWRF Operation and Maintenance (O&M) manual outlining the intent of design for the ARWRF Facility Improvements components and integrating the manufacturers' requirements for equipment operation into the overall plant operations scheme. The ARWRF Facility Improvements O&M manual supplement will be written for use by CITY of Glendale personnel, structured for ease in locating and providing quick access to information. Three (3) copies of the draft manual (outline form only) will be submitted to the CITY for review when the construction work is approximately sixty (60) percent complete. Three (3) copies of the ninety (90) percent complete draft manual, in three-ring binder format, will be submitted to CITY for review when the construction work is approximately ninety (90) percent complete. A marked-up version of the ninety (90) percent complete manual will be available during the Start-Up phase. Three (3) copies of the final manual, in three-ring binder and searchable PDF formats, will be submitted within thirty (30) working days following completion of commissioning and receipt of written comments from the CITY. The O&M manual supplement will consist of the following items as they apply only to the ARWRF Facility Improvements project components. :

- Introduction and basis of the ARWRF Facility Improvements design, including physical characteristics and operating parameters.
- A description of each of the chemical unit processes that are applicable to the ARWRF Facility Improvements project.
- Standard operating procedures and process controls for each major sub-system that were part of the ARWRF Facility Improvements project, such as the Headworks, Filtration system, Secondary Clarifiers, Odor Control system, and influent splitter boxes.
- Start-up and shutdown procedures, abnormal or emergency operating procedures, troubleshooting and process monitoring and sampling procedures that are applicable to the ARWRF Facility Improvements project.
- Maintenance procedures, based on information presented in the manufacturer's equipment manuals, including preventive maintenance schedules recommended by the manufacturers on components that are applicable to the ARWRF Facility Improvements project.
- List of recommended spare parts.
- Permits.

Task 402 – Construction Inspection Services

402.1 Part-time Resident Engineering / General Inspections: ENGINEER will provide an on-site RPR for the purpose of conducting general inspection during the construction activities on the four principal project components at the ARWRF site. This on-site inspection is based on an equivalent total time of fifteen (15) full-time and six (6) half-time months, for a total of 3,120 hours. The inspection schedule will initially be set for full-time, on-site inspection, on any day where work on the four principal components of the ARWRF Facility Improvements project is being conducted. In some instances, deviations in hours or number of RPRs may be required to cover specific project needs or overtime work with the corresponding

increase in manhours to be determined on a mutually agreeable basis by the CITY, CMAR, and ENGINEER. RPR will provide General Inspection for the ARWRF site, with responsibilities to include, but not limited to the following:

- Underground piping
- Aboveground piping and piping inside structures
- HVAC and plumbing
- Equipment installation (verifying that the item to be installed is the same as the approved submittal)
- Equipment start-up (verifying that manufacturer's recommendations as to lubrication, seal water connection, assembly, and similar installation items are complete)
- Coordinate with other disciplines to resolve conflicts
- MOPO consultation as appropriate, including coordination with ARWRF start-up items
- RFI responses, where appropriate
- Punch lists for major areas

402.2 Electrical Inspection: ENGINEER will provide electrical inspection for the four upgraded main project components on the ARWRF site, with responsibilities to include, but not limited to the following:

- Underground ductbanks
- Interface with local electrical utility, including the review of design submittals provided by SRP, as may be required to resolve design, construction, testing, or other issues between the local electrical utility and ENGINEER's original design, as necessary
- Verify material and equipment to be installed is per specifications and approved submittals
- Equipment start-up (verify that major equipment items have proper electrical installation before energization)
- Electrical/Instrumentation RFIs and RFAs, where appropriate
- Coordinate with other disciplines to resolve conflicts
- Punch lists for major areas
- Coordinate and verify the data communication installation work is accomplished per design.

402.3 Special Inspections: ENGINEER will provide on-site Special Inspectors for purposes of conducting all necessary special inspections of the four upgraded main project components and will certify compliance with the CITY's applicable codes and standards in accordance with the most current International Building Code (IBC), as adopted by the CITY. ENGINEER will sign and attach professional seal to the latest City of Glendale Certificate of Special Inspection form approving the Work, when the CMAR has completed the Work covered by the Special Inspection requirements. Special Inspectors will be capable of interpreting and making field adjustments as required that comply with the intent of the Contract Documents. Special inspections will include building safety-related architectural, mechanical, and plumbing inspections.

402.4 Special (Structural) Inspection: ENGINEER will provide on-site Special (Structural) Inspection for building and process structure construction, including steel construction, concrete construction, and masonry construction in accordance with the most current IBC sections. Specific items will include, but not necessarily be limited to, cast-in-place concrete, bolts installed in concrete, reinforcing steel and pre-stressing steel tendons, structural welding, high strength bolting, structural steel members, structural masonry, and drilled piers. Special (Structural) Inspection of shade type structures (if required) will be based on the ENGINEER-approved shop drawings submitted by manufacturer (which are based on performance-based technical specifications only). It is assumed that no shop inspection of fabricators (per IBC) will be required.

402.5 Special (Geotechnical) Inspection: ENGINEER will provide on-site Special (Geotechnical) Inspection of existing site soil conditions, fill placement and load-bearing requirements greater than 12- inches deep, in accordance with the most current version of the IBC codes, including inspection of structural engineered fill and subgrade preparation; underslab aggregate base course field density testing; foundation excavation observation for structures; soil excavation separation and stockpile management; inspection of structural and utility trench backfill; and laboratory testing with sampling per Contract Documents (including moisture density relations ASTM D698-A, sieve analysis, plasticity index and swell). Before placement of the prepared fill, the Special (Geotechnical) Inspection will determine that the site has been prepared in accordance with the approved soils report (to be prepared by Speedie & Associates). During placement and compaction of the fill material, the Special (Geotechnical) Inspection will determine that the material being used and the maximum lift thickness comply with the approved soils report. The Special (Geotechnical) Inspection will determine that the in-place dry density of the compacted fill complies with the approved soils report.

Task 403 – Substantial and Final Completion Inspection

Following written notice from the CMAR, The ENGINEER will conduct an inspection to determine if the project or the work associated with interim milestones is substantially complete in accordance with the Contract Documents. If the ENGINEER considers the work substantially complete, the ENGINEER will deliver to the CITY and the CMAR the Certificate of Substantial Completion and the punch list, the date for completion of the punch list, and recommend the division of responsibilities between the CITY and the CMAR. If the work is not substantially complete, the process shall be repeated until the work is substantially complete.

The ENGINEER will, upon completion of the punch list items as notified by the CMAR, make final inspection to determine if the finished work has been completed to the standard required by the Contract Documents, determine whether required inspections and approvals for permit compliance have been satisfactorily completed, and CMAR has fulfilled the obligations so that ENGINEER may recommend, in writing, final payment to CMAR and may give written notice to CITY and the CMAR that the work is acceptable, subject to any conditions therein expressed and in consultation with the CITY whether the work is finally complete. At or before the final inspection, the ENGINEER will request the CMAR prepare and furnish;

1. Certification that all obligations for payment for labor, materials, or equipment related to the work have been paid or otherwise satisfied.
2. Certification that all insurance and bonds required of the CMAR beyond final payment is in effect and will not be canceled or allowed to expire without notice to the CITY.
3. Written consent of surety for final payment.
4. Record document information is complete and submitted.
5. Keys, manuals, required spare parts, guaranties and warranties, and other documents necessary for close-out of the work.
6. Verification of permit closeout including the Certification of Occupancy.

If the work is not finally complete, the process shall be repeated until the work is finally complete. Promptly after the work is determined to be finally complete and the ENGINEER determines that the CMAR has properly submitted the items required for final inspection, the ENGINEER will determine whether the CMAR is entitled to final payment and, if so, will so certify to the CITY.

The ENGINEER's certification that the CMAR is entitled to final payment constitutes the ENGINEER's representation to the CITY that:

1. The work complies with (a) the Contract Documents, (b) applicable building codes, rules or regulations of all governmental authorities having jurisdiction over the Project, and (c) applicable installation and workmanship standards
2. CMAR has submitted proper Final Completion close-out documents
3. CMAR is entitled to final payment

The ENGINEER will provide to the CITY, at the time it submits a signed final payment request from the CMAR, all Final Completion closeout documents.

ENGINEER will not be responsible for the acts or omissions of the CMAR, or subcontractor, or any of the CMAR(s)' or subcontractor(s)' agents or employees or any other persons (except ENGINEER's own employees and agents) at the site(s) or otherwise performing any of the CMAR(s)' work; however, nothing contained in Task 402, shall be construed to release ENGINEER from liability for failure to properly perform duties in accordance with this scope of services.

Task 404 – Construction Drawings of Record

As-Built (Record) Drawings will be prepared by the ENGINEER, for new and rehabilitated facilities, to the level of competency and standard of care presently maintained by other practicing Professional Engineers performing the same or similar type work. ENGINEER will prepare all Construction Drawings of Record (conformed construction drawings using the Final Design Drawings and incorporating any interim project changes) and specifications showing the changes made during the construction process, including any necessary sealing of documents as may be required. ENGINEER will submit three (3) copies of the project Drawings of Record (As-Built Drawings) in AutoCAD (or Microstation) format along with CDs and a mylar copy of the drawings. The CMAR will submit separate Drawings of Record if required by the CITY.

SERIES 500 START-UP AND WARRANTY SERVICES

Task 501 – Start-Up and Warranty Services

- 501.1 ARWRF Facility Improvements Start-Up Services: Start-Up services begin after completion of the construction phase. At the end of the successful Start-Up, the project will be considered “substantially complete” in accordance with Task 403. Start-Up of the facility improvements is performed by the CMAR. The ENGINEER will be present during Start-Up and will be responsible for reporting operational issues, equipment performance issues, installation issues, discrepancies under warranties in the Contract Documents, and provide assistance for resolution of defects for correction under warranty. This Scope of Services was based on a limit of a four-man Start-Up crew, eight (8) hours per day, for a three-week equipment Start-Up period running concurrent on each of the four principal component systems (Headworks, Filters, Secondary Clarifiers, and Odor Control). All Start-Up efforts, including testing, are to be led and performed by the CMAR.
- 501.2 ARWRF Facility Improvements Start-Up Plan: ENGINEER will prepare a Start-Up plan and procedures for the CITY staff and CMAR. The Start-Up plan will include identification of key milestone activities necessary for orderly Start-Up of the new ARWRF Facility Improvement project facilities. The milestone activities will include coordination of chemical deliveries, completion of any construction activities required for substantial completion, and coordination of required CMAR maintenance activities, etc.
- 501.3 Initial Operational Support Assistance: After Start-Up services are complete, The ENGINEER will be present during the initial 30-day CITY operation of the newly constructed ARWRF facilities. The ENGINEER will be on-site for three (3) days a week for four (4) weeks assisting with possible operational

issues, equipment performance issues, installation issues, discrepancies under warranties in the Contract Documents, and provide assistance for resolution of defects for correction under warranty. The Task 501.3 services will assist the CITY with the transition of the ARWRF from CMAR Start-Up to Owner Operation.

501.4 Equipment Performance Testing: ENGINEER will verify that equipment and systems performance, operational and acceptance field-testing and start-up are conducted as required by the Contract Documents and in the presence of the required personnel, and that CMAR maintains adequate records thereof. ENGINEER will observe, record, and report to the CITY representative whether or not the testing meets design intent relative to the test procedures and start-ups.

501.5 Warranty Services: The objective of the Warranty Services task is for the ENGINEER to provide “on-call” assistance to the CITY’s operational staff on an “as needed” basis for a period of twenty-four (24) months.

- (1) The ENGINEER will document the resolution to operational issues unique to the facility in a troubleshooting chapter in the Operations Manual. The ENGINEER will document the final operational procedures of each process associated mechanical equipment, and instrumentation and control system components.
- (2) The ENGINEER will continue to document warranty issues, issue warranty requests to the CMAR, and follow up that warranty requests are satisfactorily resolved.

The level of effort for Task 501.5 is based on an estimated effort of one (1) person, for one (1) day per month, for the duration of twenty-four (24) months to provide operations assistance. It is assumed that the Project Manager, Project Engineer, and Electrical Inspector are available during this period for operations assistance. An Allowance under Series 700 –Miscellaneous Services will be developed for possible Warranty Services efforts that are undefined at this time. The use of the Series 700 funds will only be by written direction from the CITY and to the amount approved by the CITY.

SERIES 600 SCADA CONFIGURATION

SCADA and PLC programming is included as part of this Scope of Services and performed by the ENGINEER in Series 600 – SCADA and PLC Configuration Services. The level of effort includes a maximum of:

- Six (6) PLCs
- Four (4) HMI Screens
- Four-hundred (400) I/O Points
- Zero (0) OITs (OITs will be furnished and programmed by vendor/manufacturer).

An Allowance under Series 700 –Miscellaneous Services will be included for possible additional networking equipment upgrades or SCADA and PLC Configuration Services that are undefined at this time. The use of the Series 700 funds will only be by written direction from the CITY and to the amount approved by the CITY. The SCADA Configuration services scope of work is based on the following:

1. This task includes all programmable logic controller (PLC) and human machine interface (HMI) programming necessary for the areas of the plant upgraded as part of this project under Series 300. The base scope includes the following areas:
 - Headworks
 - Tertiary Filters
 - Secondary Clarifiers
 - Plant-Wide Odor Control
2. This task assumes that each of the areas identified currently have, or will be upgraded to M340 PLC’s. Additional areas not listed are included in Series 700.

3. This task does not include PLC and HMI programming for additional areas of the plant or those that are not upgraded as part of this project. Additional PLC and configuration tasks are included under Series 700 if additional work is required as part of this project.
4. This task does not include configuration or programming for remote locations that can monitor or control the local plant. The CITY will be responsible for configuration of monitoring and control at the Utility Control Center.
5. This task includes updating the plant controls system trending, and ADEQ reporting, as required due to the improvements to the plant monitoring and reporting capabilities and requirements.
6. All configuration services work will utilize the CITY's latest version of software packages for GE Intelligent Platform's HMI/SCADA - iFIX and Schnieder Electric M340 Unity Pro.
7. HMI and PLC programming will follow the City Control System Standards and Conventions document created for the Glendale Oasis Water Campus and updated as part of the Arrowhead WRF UV Upgrade project. The SCADA standards document will be reviewed and updated to incorporate additional project specific requirements as required.

601.1 SCADA Kick-Off Meeting: A Kick-Off meeting will be held with the CITY, ENGINEER, and CMAR to provide a clear statement of Series 600 goals and critical success factors. Consultant will conduct the meeting and provide meeting minutes. The following topics will be covered at the Task 600.1 Kick-Off meeting:

- Review Scope of Services
- Review and Finalize List of Owner-procured Equipment
- Review and Finalize List of Manufacturer and Model of Contractor Allowance Equipment
- Schedule and Deliverables
- Project Team Roles and Responsibilities
- Communication and Contact Information
- Review Periods
- Existing Documentation and Software Availability
- Change of Scope Procedures
- Review of Existing Configuration Standards
 - Standards and Conventions
 - Trends and Historical Data
 - Alarm Prioritizing and Area Assignments
 - Equipment Vendor Coordination
 - Integration with Existing Control System
- Review of ADEQ reporting requirements

Deliverables: Submittal of the meeting minutes for the SCADA Kick-Off Meeting.

601.2 Develop Initial SCADA Programming: Initial programming will be developed based on the Control System Standards and Conventions Document, the equipment control descriptions, and the I/O list in the Contract Documents. After initial programming is developed, the ENGINEER will provide initial programming documents to the CITY for review. After CITY review, the ENGINEER will meet with the CITY to review the initial programming and obtain comments. Initial programming documents that will be reviewed by the CITY include the following:

- PLC programming code for major equipment items
- Operator workstation overview graphic displays color printout.
- Example control graphic displays color printout.
- Example trending screen color printout.

Deliverables: PLC Programming Code in PDF format, HMI Screen Shots as JPEG files

601.3 Develop PLC Programs: After initial programming has been developed and reviewed by the CITY, the ENGINEER will develop the PLC tag listing and proceed with PLC program development. The PLCs shall be programmed to control the systems according to the control block descriptions listed in the Contract Documents within the assumptions noted previously. This task does not include development of temporary control strategies to allow full automatic control of the plant during all phases of construction. It is assumed that the CITY will control processes manually as required during construction. The ENGINEER will provide minor PLC modifications during start-up to assist the CITY in manual or semi-automatic control. If the CITY deems it necessary to implement temporary programs, that are not described in the control block descriptions to automate the process, the ENGINEER will provide these services as a supplemental service to the scope of work.

Deliverables: Final PLC Programs in PDF format, PLC tag list in PDF format

601.4 Develop HMI Graphic Displays and Database: Develop new operator control and monitoring displays for the HMI workstations. The HMI will be programmed to control the systems according to the control block descriptions listed in the Contract Documents. After the HMI graphic displays are developed, the ENGINEER will prepare documents for review by the CITY. After approximately a two-week review period, the ENGINEER will meet with the CITY to review the HMI graphics programming and obtain comments. After review of the HMI graphic displays with the CITY, the ENGINEER will incorporate the CITY's comments and develop the final HMI displays and PLC programming. Existing controls for processes not described in the control block descriptions, or herein, will not be modified or upgraded.

Deliverables: HMI graphic displays in JPEG format and meeting minutes from HMI review meeting

601.5 Configuration Quality Control: The ENGINEER will complete a quality control review of all programming documentation, PLC programming, and HMI development. The quality control review will include verification of operation as described in the control block descriptions and compliance with the Plant Control System Standards and Conventions.

601.6 I&C Coordination: I&C coordination activities will be performed to ensure the ENGINEER and equipment vendors are ready for start-up and commissioning. Tasks generally include:

- Witness and verify control loop checks, verify instrument calibrations, instruments startup and assist the SCADA system programmer with startup of SCADA system equipment.
- Verify with the CMAR that equipment installation and manufacturer start-up services have been provided prior to testing and startup from the SCADA system.
- Attend up to ten (10) CMAR construction meetings and coordinate programming startup activities with the CMAR's schedule.
- ENGINEER will verify control system equipment installation, networking, and communications status. The ENGINEER will prepare a statement of deficiency for the CMAR for any control system installation problems or communication errors. If the CMAR's work has significant deficiencies, the ENGINEER can provide services to re-verify control system installation as a supplemental service.

Deliverables: Statement of Deficiency List

601.7 Install and Commission PLC Programming: After the CMAR has completed loop checks and verified that all equipment operates in the local manual mode, the ENGINEER will install the PLC programming and commission the PLC program. PLC programming will be tested in manual and auto mode. If signals from

field equipment or other PLCs are not available, the signals will be simulated as required to verify proper operation of the PLC algorithm.

PLC code for new equipment will be as specified in the control descriptions. PLC code for existing equipment will match existing PLC code or will be revised as necessary to accommodate PLC upgrades. The CMAR will complete loop checks and verify that all new and existing equipment operates in the local manual mode prior to the ENGINEER installing and commissioning any PLC program.

If deficiencies in the CMAR's work are found during the PLC I/O verification or PLC program commissioning, the ENGINEER will provide a statement of deficiency to the CMAR.

The start-up of the PLC programs is dependent on the CMAR's completion of work and schedule. The Install and Commission PLC Programming task includes up to three (3) 5-day site visits. The ENGINEER will notify the CITY of significant changes in the CMAR's schedule or completion of work that will impact PLC programming startup costs.

- 601.8 Install and Commission HMI Programming: After the PLC I/O and programming have been verified and commissioned the ENGINEER will commission all new HMI graphic displays for control of the system. If deficiencies in the CMAR's work are found during the HMI commissioning, the ENGINEER will provide a statement of deficiency to the CMAR for resolution including, but not limited to items regarding the control system installation and communication.

The ENGINEER will notify the CITY of significant changes in the CMAR's schedule or completion of work that will impact costs for the Commission HMI Programming task.

- 601.9 Install and Commission History System: The City of Glendale uses multiple SQL databases to store historical data from the Water and Wastewater processes. ENGINEER will coordinate with the CITY's personnel on the transfer of data to CITY's historical servers. The CITY will provide all configuration for the existing historical SQL servers.

- 601.10 Final Documentation: After the system is operational and accepted by the CITY, the ENGINEER will deliver final documentation. Electronic copies will be provided on CD media and hard copies will be provided in three-ring binders. The table below lists the documentation to be provided to the CITY:

Documentation Type	Hard Copy	Electronic Copy
PLC Programs	None	4 electronic copies will be provided for all data and included in Final Documentation three ring binders.
HMI Software Database	None	
OIT Programs	None	
Graphic Displays	None	

- 601.11 Configuration Punch List: The CITY will monitor the control system during the Site Acceptance Test and will keep a log of any problems that occur during the test. The ENGINEER will meet with the CITY to review the log. Entries in the log will be categorized as items to be added or modified by the ENGINEER, items to be corrected by the CMAR or supplemental programming items not included in the scope of services. This task includes up to a five (5) day site visit to meet with the CITY and resolve the ENGINEER's configuration punch list items included in the scope of work. CITY acceptance of the completed punch list, for items included in the configuration scope of work, will indicate final acceptance of the Plant control system programming.

- 601.12 SCADA System Training: The ENGINEER will provide eight hours (two-four hour sessions) of training for the CITY's operation staff and four hours (one session) of training for the CITY's SCADA maintenance staff. The training class will be conducted on the installed control system and will familiarize and

demonstrate the operation and maintenance of new systems monitoring and control to the CITY's personnel. This task includes a training outline agenda and hands-on interaction with CITY staff. customized, detailed training manuals are not included in this task, but may be provided as a supplemental service.

SERIES 700 MISCELLANEOUS SERVICES

The following items are not the responsibility of the ENGINEER:

1. Obtaining of all easements, rights-of-way, permits (building), and approvals as may be needed. ENGINEER will prepare and submit the applications on behalf of the CITY.
2. Processing and payment of CMAR payment applications (ENGINEER will review payment application and recommend payment to CITY).

The following section of the Scope of Services describes the services and costs associated with the Miscellaneous Services for the ARWRF Facility Improvements project. The Miscellaneous Services are based on the CITY'S selection of the Construction Management at Risk (CMAR) project delivery methodology.

Task 701 – Geotechnical Services:

The geotechnical subconsultant (Speedie & Associates, Inc.) will provide professional services to supplement the Series 200 and 300 tasks. Additional geotechnical efforts, if required, will be established as an addition to the contract and the level of effort and associated costs will be included in Task 708 and will be determined by the CITY and ENGINEER.

Task 702 – Surveying Services:

Surveying Subconsultant (Aztec Engineering, Inc.) will provide professional services for Site Surveying to supplement the Series 200 and 300 tasks. Additional Site Surveying efforts, if required, will be established as an addition to Task 708 and will be determined by the CITY and ENGINEER.

Task 703 – Fire Protection Design Services:

Fire Protection Design Subconsultant (Schwimmer and Associates, Inc.) will provide professional services for Fire Protection Design Services in the areas affected by the ARWRF Facility Improvements project. Additional Fire Protection Design Service efforts, if required, will be established as an addition to Task 708 and will be determined by the CITY and ENGINEER.

Task 704 – SCADA Programming and Configuration Services:

SCADA and PLC Configuration services will be developed under Series 600 – SCADA and PLC Configuration and will include the areas described in Series 200 and 300 as part of the services for this project. Additional equipment and control upgrades have been identified that are less defined and are covered with an evaluation task developed as part of Series 600. The level of effort required for any tasks following the evaluation defined in Series 600, or any additional requirements not identified in the basic Scope of Services in Series 600 is undefined at this time, requiring an Allowance under Series 700 – Miscellaneous Services to be included. The ENGINEER will provide professional services for SCADA/PLC Programming and Configuration that applies to the ARWRF Facility Improvements project under Series 600 as best determined at the time of the development of this Scope of Services. If additional SCADA Programming and Configuration services are required, the level of effort and compensation will be established as an addition to the project, defined, and compensated under Task 704 as determined by the CITY and ENGINEER.

Task 705 – Permitting Fees:

The application costs associated with all permitting fees for activities involved with the complete permitting process for the ARWRF Facility Improvements project. The efforts and costs to prepare the permit applications are covered in Task 306 – Agency Review/Permit Assistance. If additional permitting assistance services, or permit fees, under Task 306 are required, the level of effort and compensation will be established as an addition to the project, defined, and compensated under Task 705 and possibly 708 as determined by the CITY and ENGINEER.

Task 706 – Potholing and Subsurface Investigation:

The ENGINEER has included an Allowance for efforts to update the ARWRF As-Built (Record) drawing information if required. The level of effort and compensation are undefined at this time. If additional As-Built updating services are required, the level of effort and compensation will be established as an addition to the project, defined, and compensated under Task 706 as determined by the CITY and ENGINEER. If additional subsurface investigation (potholing, trench excavation etc.) is required to determine as-built information, the level of effort and compensation will utilize the Task 708 Owner's Contingency funds.

Task 707 – Reimbursables:

Other Direct Costs (ODC) charges for printing, scanning, reproduction, postal services, courier, and local travel.

Task 708 – Miscellaneous Services (Owner's) Contingency:

A "not-to-exceed" amount of \$250,000 set aside for unforeseen design, study, or construction administration issues that were not apparent at the time the Scope of Services for the project was developed. ENGINEER is not to begin work in Task 708 without a City-approved Scope of Effort that is documented in writing, a corresponding estimated fee for the work, and an approved schedule for the contingency work.

PROJECT CLARIFICATIONS

The following project clarifications were used in developing the Scope of Services:

1. No Effluent Storage Requirements or On-Site/Off-Site Management (strategies), evaluation or design efforts are to be developed under this contract.
2. No Solids Handling strategies are included as part of this Scope of Services.
3. Engineering design of the off-site effluent disposal systems, including reclaimed water distribution systems are not included as part of this project.
4. Off-site sewer lines evaluation required to convey influent wastewater to the plant site are not included as part of this Project.
5. This Scope of Services does not include any security features, walls, landscape berming, fencing, or provisions for site monitoring outside of the areas where the ARWRF facilities are upgraded.
6. The Scope of Services does not include any work associated with archeological or environmental impact issues.
7. The Scope of Services does not include any design services for Administration Buildings, Laboratory, Solids Handling Buildings, or other ancillary facility improvements.
8. Work required to protect the plant site from floodwaters is not included in this Scope of Services. This exclusion includes studies, agency coordination, permitting assistance, and flood berm/wall design required to protect the plant from potential floodwaters. ENGINEER will develop and design a Site Drainage Strategy to drain rainwater on-site.

9. Subconsultants that may be utilized on the project include, but are not limited to:
 - Speedie and Associates Inc., – Geotechnical
 - Aztec Engineering Inc., – Land Survey
 - Landscape Design Services – McCloskey, Peltz and Associates
 - Fire Protection Design Services – Schwimmer and Associates
10. The ENGINEER will be responsible to the level of competency and standard of care deemed reasonable by competent Engineering Companies performing the same or similar type work. ENGINEER and CITY mutually agree that standard of care, as applied to design professional, will be defined as the ordinary and reasonable care required and established by expert testimony of what a reasonable and prudent professional would have done under the same or similar circumstances.
11. CMAR is responsible for on-site expenses such as air conditioned/heated trailer, phone, fax machine, potable water, computer, materials testing, and other limited miscellaneous expenses incurred by ENGINEER during Construction Administration efforts.

EXHIBIT C
Professional Services Agreement

SCHEDULE

(Cover Page)

EXHIBIT C

BASIC SERVICES – PRELIMINARY SCHEDULE

The preliminary schedule for the professional services provided under Exhibit B – Study, Design and CA&I Services, of this ARWRF Facility Improvements Project, based on an estimated 42-month planning, design and construction duration, is outlined as follows:

- Series 100: Project Administration and Management Services – February 2014 to August 2017
- Series 200: Facility Evaluation and Design Concept Development Services – February 2014 to November 2014
- Series 300: Detailed Design Services (30%, 60%, 90% and Final) – September 2014 to September 2015
- Series 400: Construction Administration Services – October 2015 to August 2017
- Series 500: Start-up and Warranty Period Services – August 2017 to August 2019
- Series 600: SCADA Configuration – March 2016 to August 2017
- Series 700: Miscellaneous Services – February 2014 to August 2019

EXHIBIT D
Professional Services Agreement

COMPENSATION

METHOD AND AMOUNT OF COMPENSATION

Compensation shall be hourly rates plus allowable reimbursable expenses

NOT-TO-EXCEED AMOUNT

The total amount of compensation paid to Consultant for full completion of all work required by the Project during the entire term of the Project must not exceed \$4,318,380.

DETAILED PROJECT COMPENSATION

Series/Task Description	Amount
Series 100 - Project Administration and Management	\$ 135,830
Series 200 - Facility Evaluation	\$ 542,680
Series 300 - Detailed Design	\$ 1,336,670
Series 400 - Construction Administration	\$ 1,574,260
Series 500 - Start-up and Warranty Services	\$ 116,200
Series 600 - SCADA Configuration	\$ 208,740
Subtotal Planning, Design, Construction Administration	\$ 3,914,380
Task 701-706 - Allowances	\$ 109,000
Task 707 - Reimbursable Expenses/Other Direct Costs	\$ 45,000
Task 708 - Miscellaneous Owner's Contingency	\$ 250,000
Subtotal Allowances/ODCs/Owner Contingency	\$ 404,000
TOTAL COST - PLANNING, DESIGN CONSTRUCTION ADMINISTRATION	\$ 4,318,380.

EXHIBIT E
Professional Services Agreement

DISPUTE RESOLUTION

1. Disputes.

- 1.1 Commitment. The parties commit to resolving all disputes promptly, equitably, and in a good-faith, cost-effective manner.
- 1.2 Application. The provisions of this Exhibit will be used by the parties to resolve all controversies, claims, or disputes ("Dispute") arising out of or related to this Agreement-including Disputes regarding any alleged breaches of this Agreement.
- 1.3 Initiation. A party may initiate a Dispute by delivery of written notice of the Dispute, including the specifics of the Dispute, to the Representative of the other party as required in this Agreement.
- 1.4 Informal Resolution. When a Dispute notice is given, the parties will designate a member of their senior management who will be authorized to expeditiously resolve the Dispute.
- a. The parties will provide each other with reasonable access during normal business hours to any and all non-privileged records, information and data pertaining to any Dispute in order to assist in resolving the Dispute as expeditiously and cost effectively as possible;
 - b. The parties' senior managers will meet within 10 business days to discuss and attempt to resolve the Dispute promptly, equitably, and in a good faith manner, and
 - c. The Senior Managers will agree to subsequent meetings if both parties agree that further meetings are necessary to reach a resolution of the Dispute.

2. Arbitration.

- 2.1 Rules. If the parties are unable to resolve the Dispute by negotiation within 30 days from the Dispute notice, and unless otherwise informal discussions are extended by the mutual agreement, the Dispute will be decided by binding arbitration in accordance with Construction Industry Rules of the AAA, as amended herein. Although the arbitration will be conducted in accordance with AAA Rules, it will not be administered by the AAA, but will be heard independently.
- a. The parties will exercise best efforts to select an arbitrator within five business days after agreement for arbitration. If the parties have not agreed upon an arbitrator within this period, the parties will submit the selection of the arbitrator to one of the principals of the mediation firm of Scott & Skelly, LLC, who will then select the arbitrator. The parties will equally share the fees and costs incurred in the selection of the arbitrator.
 - b. The arbitrator selected must be an attorney with at least 15 years' experience with commercial construction legal matters in Maricopa County, Arizona, be independent, impartial, and not have engaged in any business for or adverse to either Party for at least 10 years.
- 2.2 Discovery. The extent and the time set for discovery will be as determined by the arbitrator. Each Party must, however, within 10 days of selection of an arbitrator deliver to the other Party copies of all documents in the delivering party's possession that are relevant to the dispute.

- 2.3 Hearing. The arbitration hearing will be held within 90 days of the appointment of the arbitrator. The arbitration hearing, all proceedings, and all discovery will be conducted in Glendale, Arizona unless otherwise agreed by the parties or required as a result of witness location. Telephonic hearings and other reasonable arrangements may be used to minimize costs.
- 2.4 Award. At the arbitration hearing, each Party will submit its position to the arbitrator, evidence to support that position, and the exact award sought in this matter with specificity. The arbitrator must select the award sought by one of the parties as the final judgment and may not independently alter or modify the awards sought by the parties, fashion any remedy, or make any equitable order. The arbitrator has no authority to consider or award punitive damages.
- 2.5 Final Decision. The Arbitrator's decision should be rendered within 15 days after the arbitration hearing is concluded. This decision will be final and binding on the Parties.
- 2.6 Costs. The prevailing party may enter the arbitration in any court having jurisdiction in order to convert it to a judgment. The non-prevailing party will pay all of the prevailing party's arbitration costs and expenses, including reasonable attorney's fees and costs.

3. **Services to Continue Pending Dispute.** Unless otherwise agreed to in writing, Consultant must continue to perform and maintain progress of required Services during any Dispute resolution or arbitration proceedings, and City will continue to make payment to Consultant in accordance with this Agreement.

4. **Exceptions.**

- 4.1 Third Party Claims. City and Consultant are not required to arbitrate any third-party claim, cross-claim, counter claim, or other claim or defense of a third party who is not obligated by contract to arbitrate disputes with City and Consultant.
- 4.2 Liens. City or Consultant may commence and prosecute a civil action to contest a lien or stop notice, or enforce any lien or stop notice, but only to the extent the lien or stop notice the Party seeks to enforce is enforceable under Arizona Law, including, without limitation, an action under A.R.S. § 33-420, without the necessity of initiating or exhausting the procedures of this Exhibit.
- 4.3 Governmental Actions. This Exhibit does not apply to, and must not be construed to require arbitration of, any claims, actions or other process filed or issued by City of Glendale Building Safety Department or any other agency of City acting in its governmental permitting or other regulatory capacity.